PIRLS LITERACY 2016

PROGRESS IN INTERNATIONAL READING LITERACY STUDY 2016

South African Children's Reading Literacy Achievement

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PREFACE

The Progress in International Reading Literacy Study (PIRLS) 2016 is the fourth assessment in the current trend series. However, it is the third study for PIRLS in which South Africa has participated. The last three studies, PIRLS 2016, PIRLS 2011 and PIRLS 2006 were conducted in South Africa by the Centre for Evaluation and Assessment (CEA) at the University of Pretoria, under the auspices of the International Association for the Evaluation for Educational Achievement (IEA). The PIRLS 2006 study, conducted in 11 official languages, was the largest, most ambitious and complex national design within an international comparative study yet undertaken. The PIRLS 2011 was conducted at Grade 4 level in 11 languages, using the easier assessment known as prePIRLS (conducted solely in South Africa, Colombia and Botswana) and at Grade 5 level in Afrikaans or English only in the main PIRLS. Following on from 2011, PIRLS 2016 in South Africa included the Grade 4 learners taking the less difficult PIRLS Literacy (equivalent to prePIRLS 2011) and sub-populations of Grade 5 learners (learners writing in Afrikaans, English and isiZulu) participating in PIRLS as benchmarking participants. An innovative addition to PIRLS 2016 was the inclusion of ePIRLS, simulated online reading.

South African PIRLS 2016 met the high standards set by the IEA largely due to the input of various bodies:

- From the beginning of the project, the support of the Department of Basic Education was critical. The Minister of Basic Education, Angie Motshekga gave her consent at the outset of the project, reading literacy being one of her Department's priorities.
- Officials in the Department assisted the CEA in obtaining the latest information from the Education Management Information System (EMIS) in order for Statistics Canada to draw up the national samples. Furthermore, vital assistance was obtained from the unit responsible for examinations and assessment.
- The CEA is particularly indebted to Rufus Poliah, Qetelo Moloi and Mark Chetty for their support to facilitate data collection and during the project.
- The co-operation of all the participating schools, principals, teachers, Grades 4 and 5 learners in schools and their parents across the country was outstanding. This allowed the assessment to be conducted and enabled the data collection to be undertaken efficiently and effectively.

For the first time, the Department of Basic Education contributed financially to PIRLS 2016, although the DBE had been funding the Trends in Mathematics and Science Study (TIMSS) for some time. Unfortunately after the initiation of the project, the DBE budget was reduced by 10% due to economic realities and therefore ultimately, whilst more than half of the funds for PIRLS 2016 were obtained from the DBE, the CEA contributed the balance with the assistance of the University of Pretoria. The CEA was very grateful for this financial support given the

depressed donor support environment at that time. Furthermore, the CEA was appreciative of the ability to maintain its independence in the management, implementation and reporting of the PIRLS 2016, in light of the DBE financial support, and to retain the integrity of the PIRLS 2016 data.

The CEA's international partners were supportive from the inception of the project. The leadership of the IEA, Anne-Berit Kavli, Hans Wagemaker, Dirk Hastedt and Barbara Malak-Minkiewicz, Paula Korsnakova, Andrea Netten, David Ebbs and Roel Burgers offered advice and assistance throughout. The PIRLS Study Directors, Ina Mullis and Michael Martin, constantly encouraged the team, providing additional support when necessary and being available for advice and guidance, especially during the most difficult times. The CEA is grateful to them and their team, Pierre Foy, Ieva Johansone, Martin Hooper, Caroline Prendengast, and Shirley Gob for their expertise, guidance and support.

Statistics Canada and the IEA Data Processing Centre set very high standards for technical research support around the world, and were an integral part of this research. Marc Joncas, Sylvie LaRoche, Ahmed Almaskut, Juliane Barth, Oliver Neuschmidt, Milena Taneva, Duygu Savasci, Sebastian Meyer, Umut Atasever and Sabine Meinck are to be thanked for their accessibility and unwavering provision of knowledge and expertise.

Local participants were also involved in the research process:

The international quality assurance monitor, Margie Probyn and her assistants, visited schools and conducted quality assurance of the national study in South Africa.

Dilicom undertook co-ordination of the translations and completed one of the most difficult jobs in the study, translating 18 test instruments and two questionnaires into 10 languages, resulting in more than 200 different versions of the instruments. A team of primary school teachers in all languages assisted with the quality assurance of the language in the instruments for its appropriateness for primary school learners. Two other external companies assisted, namely: QUEST worked in the field collecting data and Consulta captured it.

The National PIRLS team received wonderful support, guidance and wisdom from the National Steering Committee, comprising the following representatives from NGOs, universities and the Department of Basic Education:

Carole Bloch, Masennya Dikotla, Rinelle Evans, Biki Lepotla, Janet Marx, Bertus Matthee, Devi Maistry, Jerry Mojalefa, Qetelo Moloi, Sarah Murray, Salome Muthambi, Lilli Pretorius, Margie Probyn, Mpuka Radinku, Molefe Ralenala, Surette van Staden, and Lisa Zimmerman (refer to Appendix A for details).

Colleagues from the University of Pretoria, Chika Sehoole, Irma Eloff, Max Braun, Gerrit Stols, supported this project, as did senior management of the University, Cheryl de La Rey, Norman Duncan and Stephanie Burton.

Special thanks are due to former Dean, Jonathan Jansen, whose vision led to the establishment of the Centre for Evaluation and Assessment (CEA) and supported the initiation of PIRLS 2006. The CEA is fortunate to have a great and extended team to draw upon consisting of:

Research support staff, Thembi Matlou, Nangamso Mtsatse, Gabriel Mokoena, and Mahon Raharinjatavo and the office manager and PA, Rose Loots, whose support was invaluable.

Scorers led by Nelladee McLeod Palane and assisted by Gabriel Mokoena and Karen Roux, under great time constraints, managed to do a very important job as did the more than 50 packers, who for six weeks, packed almost 60 000 instruments, each with their own specific identification label containing a learner's name.

The core PIRLS team, Celeste Combrinck (Project Manager), who undertook much of the project management related to data collection, Mishack Tshele (Data Manager), Mahon Raharinjatavo (Data Assistant), Nelladee McLeod Palane (achievement instrument development and scoring), Nangamso Mtsatse, and Thembi Matlou (instrument logistics), Gabriel Mokoena (fieldwork co-ordination, scoring, communications), Karen Roux (questionnaire contextualisation and development), are thanked for their exceptional commitment and dedication in conducting such a significant international comparative study under challenging circumstances.

There were highs and lows in the lead up to the PIRLS 2016. Just a few months before the data collection, the CEA was privileged to host the IEA's 6th International Research Conference held in June 2015 in Cape Town. Its success proved to be a high point of that year and provided much stimulation for the SA PIRLS team. Later that year, a week before the data collection was due to start, the "Fees must fall" campaign disrupted the planning and implementation of PIRLS as the university closed for three weeks preventing the printing, packing and distribution of the instruments. This combined with the Annual National Assessment unexpectedly implemented nationally without warning in December, prevented PIRLS 2016 from completing its data collection in 2015 and as a result, this had to be finalised in 2016; however, not before the "Fees must Fall" campaign once again shut down the university at the beginning of the following year. Whilst this was an exceptionally difficult round of PIRLS to implement given the socio-political conditions, the team was very resilient and managed despite all the problems to complete the study, and for this I have enormous gratitude and admiration.

I would like to thank the Dean, Chika Sehoole in particular, for allowing me to continue and fulfil my role as the PIRLS 2016 National Research Co-ordinator even after I had left the University of Pretoria, permitting me to complete the task of the first analysis and reporting of the PIRLS 2016 project. In this regard, I would also like to acknowledge my employer Stellenbosch University for providing me with the space to do this. Finally, I would also like to express my sincere appreciation to Celeste Combrinck not only for her pivotal role in PIRLS 2016, but also in her role as Acting Director of the CEA, allowing me to finish off my activities for PIRLS 2016 and the gracious manner in which she permitted my continued leadership of the PIRLS 2016 project in its reporting and dissemination. I feel privileged to have led three PIRLS teams over the past 10 years and to have been part of such a special international project. PIRLS

is a project that requires extensive collaboration and dedication of all concerned nationally and internationally. It has been an unforgettable experience and in the words of our former President Nelson Mandela, “It seems impossible until it is done” and that description certainly describes the South African experience for PIRLS 2016.

It gives me pleasure to present this report for the South African PIRLS Literacy 2016 study, which will be followed in due course by the reports for PIRLS 2016 (Grade 5).

Sarah Howie

National Research Co-ordinator: PIRLS 2016

5 December 2017

CHAPTER 1: INTRODUCTION TO PIRLS LITERACY 2016

Sarah Howie

1.1 Background to the Progress in International Reading Literacy Study

The aim of this report is to describe and provide contextual information for the results and findings of the International Association for Educational Achievement's (IEA) Progress in International Reading Literacy Study (PIRLS) 2016 conducted by the Centre for Evaluation and Assessment at the University of Pretoria for the implementation in South Africa.

The World Development Report 2018 (World Bank, 2017) claims that education is in a "learning crisis", as many countries are failing to provide learning for all. Across societies, those already disadvantaged learn the least, with education widening social gaps instead of narrowing them. Poor service delivery allows poor-quality schooling to persist. Currently, the World Bank claims "Learning outcomes are poor: Low levels, high inequality, slow progress" (World Bank, 2017, p.4). Nonetheless, the recent international expansion in education is regarded as impressive but may be contributing to the challenges experienced with quality in many systems. However, there are claims that schools are failing learners as struggling education systems lack key "school-level ingredients for learning: prepared learners, effective teaching, learning focused inputs, and the skilled management and governance that pulls them all together" (World Bank 2018, p.9). However, there is some progress in Sub-Saharan Africa as the region "reduced the number of out-of-school children by 27 percent from 47 million in 1996 (the peak) to 34 million in 2014, despite 59 percent growth in the primary school-age population over that period" (World Bank, 2017, p.21).

Reading Literacy is at the heart of the "learning crisis". The latest figures from UNESCO, with the release of the latest Global Education Monitoring report 2017, reveal that more than 100 million young people still cannot read, despite that the number of youth with no literacy skills has fallen by 27%. Of concern is that the adult literacy rate is below 60% in low income countries[1].

About 56% of 387 million children of primary schooling do not reach the minimum proficiency required for reading. During 2010-2015, completion rates were just 83% for primary education. By 2015, 264 million primary and secondary age children and youth were out of school. In Sub-Saharan Africa, which has the highest out-of-school rates in the world, 20.5% of children of primary school-going age are out of school (UNESCO, 2017b). This phenomenon occurs in the international context where only one of five countries guarantee 12 years free and compulsory schooling (UNESCO, 2017a).

[1] South Africa is classified as an upper middle income country and is part of the G20 (World Development Indicators Report, 2017)

Increasingly, Early Childhood Development (ECD) is seen as a means to reduce some inequity in later schooling. Based on figures in 2015, 68% of children were estimated to participate in organised learning at pre-primary or primary, one year before official primary entry age. However, the most affluent children were five times more likely to attend organised learning as the poorest (UNESCO, 2017). This has important ramifications for a country like South Africa. The Government's White Paper 5 sets the goal for full coverage of Grade R by 2010 (DBE, 2014), as part of UNESCO's Education for All (EFA) initiative. The National Development Plan (NDP) 2030 recognises that ECD is vital for later success and stipulated that there should be universal access to ECD for all children (SA Government, 2012). Although there is still much to be done to reach the EFA goal (Howie, 2011), South Africa was one of seven African countries to achieve 80% or more of their learners in pre-primary education. However, no countries in Sub-Saharan Africa were able to reach global education goals by 2015 (UNESCO, 2016). Interestingly just 17% of countries internationally legally stipulated at least one year of free and compulsory Early Childhood Education, indicating the long road ahead for many countries, including South Africa.

The contents of this report directly address the United Nations Sustainable Development Goal (SDG) 4, which aims to ensure inclusive, equitable, good-quality education and lifelong learning for all by 2030 (UNESCO, 2017, p.3) and contributes to monitoring the implementation and achievement of SDG 4 in South Africa.

This chapter provides some insight into the South Africa's participation in the IEA PIRLS studies and decisions taken that affected the PIRLS studies, and PIRLS 2016 in particular and their emergence as a significant contributor to monitoring the quality of education nationally and internationally over the past decade. Firstly, the entities behind the organisation of PIRLS in South Africa and internationally are described and thereafter, the functions of large-scale international assessments are discussed. This is followed by the background to South Africa's entry into international large-scale assessments (1.2). An overview of PIRLS is provided in 1.3. The context for the study is described in 1.4, The South African Education Landscape. The conclusion is presented in 1.5 with the structure of the report in 1.6.

1.1.1 Centre for Evaluation and Assessment, University of Pretoria

The Centre for Evaluation and Assessment (CEA) was established within the Faculty of Education at the University of Pretoria in 2002 by the founding Director, Professor Sarah Howie, following the vision of former Dean, Professor Jonathan Jansen. The Reading Literacy Programme was launched in 2004 and included PIRLS 2006. The CEA subsequently became the National Research Centre for PIRLS 2006, PIRLS 2011, PIRLS 2016 as well as another study managed under the auspices of the International Association for the Evaluation of Educational Achievement (IEA), the Second International Technology in Education Study (SITES) 2006. The CEA has undertaken and completed more than 70 research and development projects to date. It has also been an incubator for postgraduates with about 40 (mostly PhD graduates) in Assessment and Quality Assurance with several undertaking studies related to the PIRLS studies (Labuschagne, 2014; McLeod Palane, *in press*; Roux, 2014; van Staden, 2011; Zimmerman, 2011, amongst others).

1.1.2 The International Association for Educational Achievement

The IEA is an international non-government organisation founded about 50 years ago to undertake international studies in education. Its mission is to continue enhancing the quality of education through its studies. The membership of the IEA has grown from the initial 12 to the current list of 62 educational research institutes, ranging from universities to ministries of education, each representing their country. The IEA has evolved from and remains a unique network of scholars, researchers and policymakers collaborating and conducting studies on educational achievement worldwide (refer to: http://www.iea.nl/brief_history_of_iea.html).

PIRLS 2016 was undertaken in South Africa and internationally in 2015 and 2016. However, international large-scale assessments and comparative studies of educational achievement date back to the early 1960s. The expansion and development of these types of studies was made possible by methodological developments over the past three decades (Howie, *in press*). The studies also involve extensive collaboration, funding and negotiation between participants, organisers and funders (Plomp, Howie & McGaw, 2003).

1.1.3 Functions of International Large-Scale Assessments

International large-scale assessments have a variety of purposes, which include: to compare levels of national achievement between countries; to identify the major determinants of national achievement, country by country; to examine to what extent they are the same or differ across countries; and to identify factors that affect differences between countries (Postlethwaite, 1999, p. 12). Plomp (1998) summarises these functions as description (mirror), benchmarking, monitoring, enlightenment, understanding and cross-national research (see also Plomp, Howie & McGaw, 2003). In the late 1980s and early 1990s, the international large-scale assessment studies served another very important purpose, namely the integration of formerly excluded and isolated education systems (for example, countries in the former Soviet Bloc and South Africa). The studies allowed these countries to break away from their previously isolated positions, join the international debates through their participation in projects such as the Third International Mathematics and Science Study (TIMSS) due to the financial sponsorship by the World Bank and training administered by the IEA (Plomp, Howie & McGaw, 2003)

Increasingly the purpose of monitoring education systems is to evaluate achievement progress across subjects in schooling in response to global calls for improving quality of education for all (Howie 2013, UNESCO, 2012). The most recent report by UNESCO on Global Monitoring 2017 (UNESCO, 2017a) stresses the importance of effective, responsible and appropriate accountability measures to be in place. It highlights the challenges for government to design and implement cost effective and scientifically credible assessments systems which have different purposes (Greaney & Kellaghan, 2012) to cross-national large-scale assessments such as PIRLS.

1.2 South Africa's entry into International Large-Scale Studies

PIRLS 2016 was implemented just over 20 years after South Africa's first IEA large-scale study, the then Third International Mathematics and Science Study (TIMSS) 1995. The results of that study caused much concern about the state of South Africa's mathematics and science education and led to a follow-up study, Trends in Mathematics and Science Study (TIMSS) 1999. However, in TIMSS 1999, the research team included a national survey of English language proficiency given that the TIMSS 1995 and 1999 reports highlighted the very poor language skills evident in the written responses that had been written in English (and Afrikaans as the then languages of instruction). The results of the English Language proficiency test revealed that learners struggled to formulate their answers in English (Howie, 2001; Howie & Hughes, 1998), and the secondary analyses (see Howie, 2002; Howie, 2003) showed a strong relationship of the effect of language on the mathematics achievement at Grade 8 with learners with poor proficiency in English achieving lower results in mathematics.

The interest in the language question grew as it was hypothesised that, in addition to the learners' difficulty in writing their answers to the mathematics questions, they could also have been struggling to comprehend the questions given that about 80% of the learners were learning in an additional language (Howie, 2002). This resulted in the launch of the Reading Research Programme in 2004 at the newly established Centre for Evaluation and Assessment the University of Pretoria, initially funded by the Royal Netherlands Embassy. Part of that programme included the implementation of PIRLS 2006.

The results of PIRLS 2006, testing Grade 4 and 5 learners in all 11 official languages, confirmed the hypothesis that learners were struggling with reading comprehension (mostly written in their home language) (see Chapter 6). However, funding was an issue for PIRLS 2011 as the Royal Netherlands Embassy withdrew its funding of education research from South Africa, but the CEA was fortunate to secure funding from the Zenex Foundation, the National Research Foundation and the South African Netherlands Development Programme, maintaining the study's independence. However, the funds were not sufficient to duplicate the PIRLS 2006 design and therefore, in 2011 it was not possible to compare provinces as in 2006, but only languages (see Chapter 3 for details).

The decision to continue with the PIRLS studies in 2016 was partly also informed by the fact that there were few external studies of educational quality on the same scale and that other national indicators were either unable to measure progress over time or were showing a lack of improvement in language and reading literacy, in particular. Furthermore, Umalusi reported that the National Senior Certificate examinations were revealing concerning evidence of learners at Grade 12 level being unable to comprehend questions, formulate even short responses to questions and that the quality of writing in extended response questions and essays was poor (DBE, 2014).

1.3 Overview of PIRLS

The Progress in International Reading Literacy Study (PIRLS) has recurred every five years since 2001, and is one of the IEA's larger projects. PIRLS 2016, recently completed, is the fifth in a series of trend studies. The first Reading Literacy Study was conducted in 1990 and was the first comparative study of its kind in Reading Literacy (Postlethwaite & Ross, 1992). This was followed 10 years later by the Progress in International Reading Literacy Study 2001 (PIRLS 2001), in which 35 countries participated (Mullis, Martin, Gonzalez & Kennedy, 2003). PIRLS is directed internationally by the TIMSS and PIRLS International Study Centre at Boston College in co-operation with the IEA Amsterdam, IEA Hamburg and Statistics Canada. Most of the participating countries were European, in addition to the USA and Canada, with only two countries in Asia and South America and one in Africa participating. PIRLS 2006 was conducted in 2005 and 2006 with 40 countries participating (Mullis, Martin, Kennedy, & Foy, 2007). PIRLS 2011 was conducted in more than 50 educational systems as several provinces and regions participated for benchmarking purposes, in addition to whole countries (Mullis, Martin, Foy, & Drucker, 2012). PIRLS 2016 had 61[2] participating systems (listed below) around the world (50 countries and 11 benchmarking entities; for example, regions of countries, additional grades or language groups from participating countries) (Mullis, Martin, Goh, & Prendergast, 2017), and was the largest reading Literacy Study to date.

- Australia
- Austria
- Azerbaijan
- Bahrain
- Belgium (Flemish)
- Belgium (French)
- Bulgaria
- Canada
- Chile
- Chinese Taipei
- Czech Republic
- Denmark
- Egypt
- England
- Finland
- France
- Georgia
- Germany
- Hong Kong SAR
- Hungary
- Iran, Islamic Rep. of
- Ireland
- Israel
- Italy
- Kazakhstan
- Kuwait
- Latvia
- Lithuania
- Macao SAR
- Malta
- Morocco
- Netherlands
- New Zealand
- Northern Ireland
- Norway (5)
- Oman
- Poland
- Portugal
- Qatar
- Russian Federation
- Saudi Arabia
- Singapore
- Slovak Republic
- Slovenia
- South Africa
- Spain
- Sweden
- Trinidad and Tobago
- United Arab Emirates
- United States

Benchmarking Participants

- Buenos Aires, Argentina
- Ontario, Canada
- Quebec, Canada
- Denmark (3)
- Norway (4)
- Moscow City, Russian Federation
- Eng/Afr/Zulu - RSA (5)
- Andalusia, Spain
- Madrid, Spain
- Abu Dhabi, UAE
- Dubai, UAE

[2] Note: Norway chose to assess the fifth grade to obtain better comparisons with Sweden and Finland but also collected benchmark data at the fourth grade to maintain previous trends. The Republic of South Africa (RSA) benchmarked at the fifth grade with schools where learners have instruction in English, Afrikaans, or isiZulu.

The PIRLS studies are conceptualised (Campbell, Kelly, Mullis, Martin & Sainsbury, 2001) within a similar systems-related model to previous IEA studies, although for these trend studies, the role of the home is conceptualised as having a more direct bearing on the interaction between the home and classroom and home and school. The role of the curriculum (intended, implemented and attained) is also evident in the conceptualisation of the studies.

More than 340 000 learners, 330 000 parents, 16 000 teachers and 12 000 schools participated in total. The PIRLS 2016 assessment is based upon PIRLS 2016 Assessment Framework, developed with participating countries, and based on two overarching Purposes for Reading, namely: the literary experience and to acquire and use information. Four Comprehension Processes are assessed: focus on and retrieve explicitly stated information, make straightforward interferences interpret and integrate ideas and information and evaluate contribute content and textual elements.

In PIRLS 2011, an innovation, prePIRLS, was initiated. This was followed by PIRLS Literacy 2016. Its design is similar to PIRLS; however, it includes some less difficult passages and items. Its results are reported on the PIRLS Scale (see Chapter 3) and are directly comparable to PIRLS. PIRLS and PIRLS Literacy Assessments have 12 passages (6 Literary and 6 Information) and approximately 180 items. Not all learners take all passages and items but rather PIRLS uses a rotated tested design allowing each learner to answer only 13-15 items based upon two passages.

ePIRLS 2016 was also implemented as a computer-based assessment of online reading and provides data on how well students have developed 21st Century online reading skills. South Africa only managed to assess nine schools in Gauteng in English due to insufficient numbers of primary schools having (adequate) ICT facilities and capacity. Of more than 300 schools reportedly having the necessary resources on the government database, the reality was quite different upon visitation prior the fieldwork. Therefore, the number of schools tested did not meet the required number of schools and learners to be included in the international report.

PIRLS aims to provide the “best policy relevant information about how to improve Teaching and Learning and to help young students become accomplished and self-sufficient readers”. To achieve this goal, PIRLS includes questionnaires for learners, teachers, parents and principals (to be able to describe home, school and classroom contexts) in the assessment information. The PIRLS Encyclopaedia provides further information cross-countries based upon the PIRLS Curriculum Questionnaire (see Mullis, Martin, Goh & Prendergast, 2017). PIRLS has a rigorous quality assurance process implemented by the international study centre, Statistics Canada, IEA Hamburg, IEA Amsterdam. Chapter 3 provides more details about the design and methods utilised in PIRLS 2016 and Chapter 6 describes the trends on reading achievement emerging from the South Africa data for 2016 compared to previous cycles.

1.4 The South African Education Landscape

The major focus of South Africa's education system in the past twenty years has been to reconstruct, expand and transform structurally and substantively. In 2015 when PIRLS 2016 was implemented in South Africa, the population had grown to more than 50 million people (Statistics South Africa, 2012). Nationally, there are nearly 19.4 million learners mostly attending public schools, of whom 8.9 million are in primary schools (Statistics South Africa, 2016). Approximately just over two million of these were in Grade 4 and 5 at approximately 17 000 primary schools.

South Africa was classified by the United Nations Development Programme as being a Medium country on the Human Development Index (Very high, High, Medium and Low) and ranked 118 out of 188 countries in 2016. However, with equity and access being at the top of the Government's priority list, access has improved to the extent that primary education is almost universal (see Table 1.1). At this stage, South Africa's access and participation rates exceed those of Sub-Saharan Africa. They also exceed two of the upper-income group indicators. Unfortunately, at this stage there are no data to report on the Net Enrolment[3] indicators which are more informative on enrolment at school level, as this relates to the age appropriate cohort for that education level in school.

Table 1.1: Access and Participation in Pre-Primary Education and Primary Education

Country and world comparison	Participation in Pre-Primary		Access to and participation in Primary Education			
	Total enrolment in Pre-Primary education 2015[4]	Gross enrolment ratio Pre-Primary education and early childhood educational development %	Total enrolment in primary education (female)	Gross enrolment in primary education (%)	Primary education adjusted net enrolment ratio %	Pupil:teacher ratio for primary school
South Africa	50	34[5,6]	49	100[7]	No data	32
Sub-Saharan Africa	50[8]	20	48	99	79	43
Upper-income countries	47	48[9]	47	106	96	*[10]

Source: Compiled from Global Education Monitoring 2017 report Pp 314-333. (UNESCO, 2017a) and the Human Development Report 2016, pp230-233 (UNDP, 2016)

[3] The net enrolment rate (NER) in primary education is the ratio of the number of children of official. primary school age who are enrolled in primary education to the total population of children of official primary school age, expressed as a percentage. https://www.unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.31/2012/22_MDG_Handbook_2.1-3.1_EN.pdf (18 November 2017)
[4] School year ending 2015
[5] Data are for the school year 2014
[6] In the Human Development report, average percentage for the period for only Preprimary for the Percentage of preschool age children 2010-2015
[7] Data are for the school year 2014
[8] Sums and weights averages: partial imputation due to incomplete country coverage (between 33% and 60% of population for the region or other country grouping
[9] Sums and weights averages: partial imputation due to incomplete country coverage (between 33% and 60% of population for the region or other country grouping
[10] No comparable data for upper-income countries but comparable figure is given for Medium Human Development category where South Africa is included and that is 29 (pupil:teacher ratio) somewhat lower than South Africa with a better pupil to teacher ratio for primary school.

In 2015 when PIRLS 2016 data was being collected, Gross Enrolment in primary education was 100%, higher than the Sub-Saharan African average. The total enrolment of girls in primary education was 49% higher than Sub-Saharan Africa and the average of the upper-income group. However, in a local report published in South Africa in 2016 by Statistics South Africa with data compiled from the General Household Survey in 2015, Gross Enrolment Rates (GER) for Primary were said to be 123% in 2015 (Statistics South Africa, 2016). These figures vary considerably across provinces with the lowest GER being in Gauteng at 116% and the largest in the Eastern Cape at 137 % followed by Limpopo (128%). This is worthy of noting given the results presented in Chapters 4 and 5. Of those attending preschool, 68.9% were at public institutions and 31% at private institutions. At primary school level, however, 93% of learners attended public institutions and about seven percent attended independent schools.

Relative to the Sub-Saharan region and other Upper-Middle countries, South Africa spends a considerable amount on education (see Table 1.2).

Table 1.2: South African Government Expenditure on Pre-primary and Primary Education compared to Sub-Saharan and Upper Middle Income Countries

			Pre-primary Education		Primary Education	
Country and world comparison	**Government expenditure on education as % of GDP 2015**	**Government expenditure on education as % of total government expenditure 2015**	Government expenditure per pupil in constant 2014 PPP U$ 2015	Government expenditure per as % of GDP per capita 2015	Government expenditure per pupil in constant 2014 PPP U$ 2015	Government expenditure per pupil as % of GDP per capita 2015
South Africa	6.0	19.1	771	6.0	2 271	17.6
Sub-Saharan Africa	4.1	16.9	51	3.0	246	10.5
Upper Income countries	4.2	14.0	No data available	No data available	No data available	No data available

Source: Global Education Monitoring Report 2017 (UNESCO, 2017a, pp 402-404)

In 2015, in total, South Africa spent about six percent of its Gross Domestic Product (GDP) on education and 19% of its total government expenditure on education annually (UNESCO, 2017a), which is high compared to other developing countries. Spending on education has been consistently high in South Africa relative to other countries. This is very important given that South Africa has one of the highest inequality rates in the world perpetuating both inequality and exclusion with a Gini coefficient of .65 in 2014 (World Bank, 2017).

Education in South Africa is compulsory for Grades 1 to 9, and non-compulsory for Grades 10 to 12.

Table 1.3: Structure of Compulsory Education in South Africa, up to 2017

Phase	Grades	Ages	Status of Education	School Level
Pre-Primary	000, 00, Grade R (Reception)	4-6	Not compulsory (2018)	Pre-Primary
Foundation	1-3	7-9	Compulsory	Primary
Intermediate	4-6	10-12	Compulsory	Primary
Senior	7-9	13-15	Compulsory	Primary (to Grade 7) Secondary (Grades 8 and 9)

Currently 87% of public schools are non-fee paying schools containing more than 70% of the learners in the country. South Africa has both Government (public) and private (independent) schools within its education system with about 6% of the schools being private.

A considerable proportion of schools in South Africa still suffer serious shortcomings, ranging from poor access to water, telephones and electricity, to the poor condition of many school buildings despite significant investments in infrastructure. Currently more than 20% of schools do not have very basic facilities and do not meet basic safety norms (DBE, 2014). However, in the latest Global Monitoring Report 2017, it is reported that 97% of South African schools (in 2014) have basic drinking water and 100% have basic sanitation or toilets. Unfortunately, and pertinent to the ePIRLS study, no information was provided on the Information Communication and Technology (ICT) data and therefore, there are no figures for electricity, internet use for pedagogical purposes nor computers used for pedagogical uses, although the majority of countries did not appear to have this data. This makes the data collected in PIRLS Literacy and PIRLS 2016 particularly valuable (see Chapters 7 and 8). Demand for schooling, as evidenced in the significant growth in enrolments, has put pressure on the provisioning of educational facilities and supplies. One example directly relevant to reading literacy is that few schools have well-equipped libraries and many communities are without community libraries. This leaves the majority of people with little access to reading materials as books are unaffordable for most people and the majority of homes have few books and other reading materials.

Most teachers in the system in general still have a 3- or 4-year teaching diploma from a teacher training college, This is despite the closure of teacher training colleges almost 20 years ago. The teaching force is ageing (See Chapter 8) and there is concern that insufficient numbers of younger, qualified people are entering the teaching profession (Howie et al., 2012). Since 1997, teacher training has been offered either as a four-year degree or as a one year postgraduate qualification after a Bachelor's degree.

Apart from provisioning challenges, there has also been the almost continuous change in the curriculum with curriculum reform having undergone three iterations in the past 20 years, leading to curriculum change fatigue which has impacted teacher morale (see Howie, Combrinck & Roux, 2017 in Mullis, Martin, Goh & Prendergast, 2017 and Chapter 2 in this report). The current Curriculum and Assessment Policy Statement (CAPS) provides for an Intermediate Phase (which includes Grades 4 and 5) which has six subjects - Home Language,

First Additional Language, Mathematics, Natural Science and Technology, Social Sciences and Life Skills. Furthermore, for instance with Home Language, CAPS specifies instructional time per language skill - Listening and Speaking, Reading and Viewing, Writing and Presenting as well as Language Structures and Conventions (see Chapter 2 for details)

The Constitution of 1996 specifies that all children in South Africa have the right to be educated in their own language. However, the multilingual nature of South Africa presents challenges to the curriculum and teachers in the implementation of the curriculum (see Chapter 2 for details). Whilst there have been changes in the official language profiles, the pattern has remained where isiZulu, isiXhosa and Afrikaans are spoken most widely whilst there has been growth mainly in the English language since the 1996 Census from 8% (Statistics South Africa, 2001) to 10% by 2016 (see Chapter 2).

1.5 Major Findings and Impact of previous PIRLS Studies

As mentioned previously, South Africa participated in two earlier cycles of PIRLS, in 2006 and again in 2011. Some of the main findings are listed below, but for more details see the previous national reports (Howie, Venter, Van Staden et al., 2009; Howie, van Staden, Tshele et al., 2012). PIRLS 2006 provides an important baseline for the PIRLS 2016 data, and the trend data provided by the benchmark participation is based upon this data.

1.5.1 PIRLS 2006

South Africa participated at the Grade 4 and Grade 5 level with full nationally representative samples, stratified for both province and language. The reason for including Grade 5 (originally as a national option) initially, was based upon apprehension about the South African Grade 4 learners being able to cope with the demands of the assessment and particularly given the fact that Grade 4 is an important and demanding transition year for many moving into LoLT in a second language. This decision proved to be more significant for the next decade of research than previously envisaged as the Grade 4 South African learners fell far short of the international reading levels tested in PIRLS 2006 and the data for the majority of Grade 4 learners was so poor that the IEA requested that the South African Grade 5 data be used, due to the technical (measurement) difficulties for the overall international data caused by the low Grade 4 performance.

1.5.1.1 Reading Achievement

South African Grade 5 learners achieved the lowest score compared to Grade 4 children in the 39 participating countries. They achieved approximately 200 points below the international average score of 500. There was, however, a significant difference in achievement between Grade 4 learners and Grade 5 learners in South Africa indicating a significant progression in reading achievement across all languages from Grade 4 to Grade 5. Three-quarters of South African learners were not able to reach the lowest international benchmarks and only two percent could reach the highest international benchmark compared to only seven percent of children internationally and one-fifth of children in the Russian Federation and Singapore, who attained this level.

Performance across all 11 languages was below the international mean. Learners tested in all African languages achieved very low scores with 86% to 96% not reaching the lowest international benchmark, compared to half of the learners writing in English and Afrikaans. Children writing the test in Afrikaans achieved the highest average score, although children whose home language was English (and who wrote the test in English), achieved the highest score overall. Despite low achievement, South African learners had generally high reading self-concepts and positive attitudes to reading.

1.5.1.2 Home Background

South African households had very few books in the home with half of the houses having fewer than 10 books. Few children had been exposed to early reading literacy activities with their families. The parents' levels of education (as mediated through the numbers of books in the home and cultural communication with children) were strongly correlated with reading achievement. South African parents (and guardians) demonstrated relatively low levels of involvement with schools and participation in the education of their children. This was taken into context with the number of many child-headed households or children who live with guardians or other family members. South African children had one of the highest levels of bilingualism in the study, reflected by the large percentage of two-parent homes and speaking more than one language at home.

1.5.1.3 Classroom Factors

In most schools, insufficient time is spent on reading activities or formal reading instruction. This is in contrast to top performing schools and more frequent reading instruction, which is related to higher achievement of South African learners. South African teachers read less often in their spare time compared to those in the highest achieving countries in PIRLS 2006. Teaching of more complex reading skills is introduced at a much later stage for South African learners than internationally, where these are initiated much earlier. There are problems with the provisioning of textbooks and learning materials. Only half of the South African schools have adequate resources in terms of instructional materials. Further investigation is needed in terms of the type and quality of textbooks used in classrooms and their availability in African languages.

1.5.1.4 School Environment

Three-quarters of the principals reported that half of their pupils or more were from economically-disadvantaged homes. Nearly two-thirds of the schools had about 10% of their learners who spoke a different language to the language of the test. One in five learners attended a school where the inadequacy of the resources was reported to be hampering teaching and learning. However, there were countries where significantly more learners were negatively affected and where almost four out of five learners were affected in this way. More than half of South African primary schools did not have a library and the same percentage do not have classroom libraries either. Whilst two-thirds of parents felt that the school environment was safe, this did not concur with the perceptions of the principals nor the learners. Learners in particular, did not feel safe in general, and about one out of four Grade 5 children felt very safe at school and only one-third of principals felt that their schools are very safe. Two-thirds of teachers were satisfied with their teaching career but this feeling of satisfaction did not correlate with higher achievement.

1.5.2 PIRLS 2011

As explained earlier, the design of PIRLS 2011 was different to the earlier study based upon the experiences of PIRLS 2006. South African Grade 4 learners wrote the less difficult prePIRLS assessment whilst learners writing in Afrikaans and English at Grade 5 level participated in PIRLS 2011 as benchmark participants to maintain some trend data. A summary of the main findings is presented below.

1.5.2.1 South African Grade 4 prePIRLS Achievement

South African Grade 4 learners, particularly those tested in African languages, achieved well below the international centre point despite having written an easier assessment. They were still performing at a low level overall on an easier assessment compared to their counterparts internationally. There was a significant gender gap in achievement, with Grade 4 girls outperforming boys in South Africa schools. Learners tested in Afrikaans and English performed relatively well and above the international centre point. However, those tested in all African languages, despite most writing in their home language, achieved very low, and learners tested in Sepedi and Tshivenda were especially low. Few South African learners (6%) were able to read at an advanced level, although 71% were able to reach a rudimentary level of reading and attain the Low International Benchmark. More than half the learners tested in Sepedi and Tshivenda could not read at a fundamental level.

1.5.2.2 South Africa Grade 5 PIRLS Achievement

There was no difference in the overall achievement for South African learners in 2011 compared to 2006. Grade 5 learners tested in Afrikaans or English were still performing below the international centre point by approximately 80 points, which is below the international average score of 500 fixed for the reading literacy of Grade 4 learners internationally. They achieved a level similar to learners in Saudi Arabia, Indonesia, Qatar and Botswana (Grade 6) and well above learners in Oman and Morocco, bearing in mind these countries' samples tested their entire population and South Africa only tested part of its population. There was a significant gender gap in achievement, with Grade 5 girls outperforming boys in South African schools. Forty-three percent of South African learners tested in Afrikaans or English were unable to reach the Low International Benchmark and only four percent could reach the High International Benchmark. More learners tested in Afrikaans attained the Low International Benchmark than did those writing in English.

1.5.2.3 Home Environment

South African households had, on average, few resources compared to many countries in PIRLS 2011 and learners from homes that are well resourced in education terms, achieved higher reading achievement scores. Grades 4 and 5 learners, who liked reading, were motivated to do so and were confident readers, achieving higher scores than those who did not like reading, were not motivated to read and were not confident in their reading. Children of parents who liked reading achieved on average higher scores than those whose parents did not like reading. South African parents have exceptionally high aspirations for their children's education levels and aspire to their undertaking postgraduate education.

1.5.2.4 Classroom and Teacher Factors

Most Grade 4 and Grade 5 teachers are quite experienced with on average 17 years of teaching experience. Almost all teachers regarded their work as important, although half reported being more enthusiastic about teaching at the onset of their careers. The majority of teachers of Grade 4 and 5 learners held formal qualifications in Education, namely post-secondary college or university degrees and specifically Foundation Phase teaching. Almost a third of teachers reportedly spent less than six hours in in-service training that dealt with reading and teaching reading, specifically in the past year. The average prePIRLS 2011 class size was 40. Large average class sizes (>40) are found for learners who are taught in African languages, with only Afrikaans and English classes below the national average of 40. No relationship was found between instructional time and achievement in reading, possibly indicating a lack of effective teaching and learning. There is considerable variation across languages in terms of time on task for language and reading; however, on average learners spent no more than 5 hours per week on reading and language. Teachers spent most of their instructional time on basic reading skills and strategies and less time on more inferential types of skills. Teaching of more complex reading skills (such as making generalisations, describing text style and structure, and determining the author's perspective) was introduced at a much later stage for South African learners than internationally, especially for learners tested in isiNdebele and Xitsonga. Learners exposed at an earlier grade tended to achieve higher scores in reading. Reading homework was assigned to only one-third of the learners in Grade 4 on a daily basis and to Grade 5 learners weekly.

Learners engaged in reading, tended to achieve higher scores. Learners' lack of prerequisite skills and knowledge negatively affected instruction to some extent in most schools and was reported particularly in schools where Afrikaans and English were tested. Teachers were still experiencing problems with the provision of textbooks and learning materials and teachers reported being hampered by lack of resources. About 30% of learners were in classrooms with no classroom library or reading corner and a further 40% were in classes where there are very few books in the existing classroom library. With some exceptions, textbooks remain the dominant resource for both Grade 4 and Grade 5 teachers and few teachers use a variety of children's books as a basis for instruction.

1.5.2.5 School Factors

Almost half of the Grade 4 learners came from schools in remote rural areas and achieved more than 100 points less than their urban peers. However, learners in schools in which a very high emphasis was placed on academic expectations by the principals and teachers achieved much higher scores than those in schools with lower expectations. More than half of the schools in the Grade 4 sample came from schools with no school libraries and these schools achieved, on average, 155 points less than schools with well-resourced libraries. One in five learners attended a school where the inadequacy of the resources was reported to be hampering teaching and learning. However, there were countries where significantly more learners were negatively affected and where almost four out of five learners were affected in this way. Learners in schools, where teaching and learning is negatively affected by shortages

of reading resources, achieved over 100 points less than schools that were not affected by shortages. Almost half of the learners were in schools where there were moderate problems with teachers' working conditions. Learners in schools where teachers had hardly any problems with their conditions, achieved between 60-95 points more than those learners whose teachers had moderate problems.

More than half of the learners in Grade 4 experienced being bullied weekly, which is substantially different from all the other countries in the study. These children on average tended to achieve more than 50 points less than learners who were not bullied as often. Children, who were frequently bullied, tended to be in rural or township environments, in large classes and from low socio-economic home backgrounds.

1.6 Conclusion

Five years after PIRLS 2011, PIRLS 2016 in South Africa has completed another milestone in education research in South Africa with its 10-year trend data for benchmark participants (to be reported in the National Report on Grade 5), its innovative case studies on ePIRLS and a five-year trend data for Grade 4 learners in all 11 languages in South Africa (reported in this report). No other country has faced the extensive challenge of preparing and implementing a research study such as the South African study conducted in 11 languages.

This report on PIRLS 2016 provides empirical evidence on the status of reading literacy comprehension levels currently in South Africa and permits the investigation of those on provincial level as well as for each one of the official languages. Furthermore, due to the measurement models applied, achievement data can be tracked over five and 10 year periods measuring progress over time and the extent to which changes are occurring within South African schools, classrooms and homes. The benchmark data, reported in Chapter 5, are particularly important in highlighting not only what children cannot do, as made clear in Chapter 4, but also what they are able to do at this critical developmental age in terms of reading comprehension. Whilst Chapters 4-6 provide a description and deeper analysis of South African children's reading literacy achievement, the extent to which it compares internationally and to what extent they have difficulty in attaining higher order reading levels reflected in higher benchmarks, Chapters 7-9 provide valuable contextual data often not included in the provincial and national assessments as once again international data on the same variables are available for comparative purposes, permitting a deeper reflection on policies and practices within South African education. Chapters 1-3 present essential background, policy and methodological information to enable the reader to better understand the PIRLS Literacy Study.

PIRLS 2016 was implemented not for the sake of implementing an assessment but rather towards growing the knowledge base and assisting the government and society in general in monitoring its progress in a critical area of education more than 20 years after democracy and the integration of 17 different departments of education into a single department. The study aims to provide feedback on the progress made to date, amongst others through its ability to measure trends over time. Furthermore, the study through its report provides evidence for

the need for ongoing independent monitoring, evaluation and assessment of (public) primary education towards effective accountability and achieving quality education for all children in South Africa. Independent monitoring is essential in a free, democratic state to gain public trust and support as well as providing added reassurance to society about its achievement of specific goals. Given South Africa's history, it is important that the broader community is convinced that reports on the quality of education in the public schooling sector, in particular, are based upon valid and reliable data that is both available and able to be widely disseminated following a research agenda. One of the largest stumbling blocks in Africa is the absence of available, recent, and credible data for planning purposes and decision making. Noteworthy in reporting this study was the noticeable increase in suspicion and resistance experienced by the research team in gaining the agreement of schools to participate in this cycle and reports of assessment and curriculum change fatigue that became evident in conversations with principals and staff at schools. This will have to be a consideration for other research of this nature in the future. Some discussion follows in Chapter 10, highlighting some enabling conditions at school, within classrooms and homes. The obvious need for communities to take collective responsibility for education is evident in the conclusions. Whilst the teachers in the classrooms are key to changes and improvements in education, a supportive environment where teachers, their peers, the leadership of the school, policymakers, parents as well as the learners each play their part and take responsibility for it, can no longer be overlooked. Whilst it is tempting for some to blame teachers for the achievement results in PIRLS and other studies, this is disingenuous and ignorant of the complex realities within which education takes place. Hence responsibility needs to be shared in order to make progress and create the necessary supportive environment in the future.

1.7 The Structure of the Report

The rest of this report focuses on the context, design, conduct, and findings of PIRLS 2016. Chapter 2 provides the context in terms of language and literacy internationally and the policy context locally. In Chapter 3, the research design and methods are explained and argued in terms of the international study as well as the implementation and adaptations made in the South African context and the reasons.

In Chapter 4, the results for the achievement tests are described and interpreted. The overall international results are summarised and the South African results are analysed for all 11 test languages, for the nine provinces, by gender, location, reading comprehension purposes and processes.

Chapter 5 follows with a description and explanation of the international benchmarks providing a qualitative description of the quantitative results at four performance levels. The benchmarks are analysed comparatively internationally, by test language, province, gender and location.

Chapter 6 describes the trends in achievement between three PIRLS cycles and provides the results overall, by language and benchmarks.

In Chapter 7, contextual data derived from the *School Questionnaire* is described and analysed. Issues related to the environment and climate of the school are presented based upon the questionnaires received from the school principals. The profile of the learners, school facilities and resources, academic ethos, school discipline and safety are described and discussed.

In Chapter 8, the findings based upon the *Teacher Questionnaire* are presented. These focus primarily on the profile of the teacher (age, experience and qualification), the classroom environment, resources, instructional strategies and teacher attitudes and are based upon information derived from the home language teachers of the Grade 4 learners who were tested.

Chapter 9 provides a description of the learners and their home environment. In particular attitudes, motivation and confidence from the learner perspective. The home environment is described in terms of the home resources, parents' involvement with their children regarding early literacy and observations about their children's skills and homework from school. Parental education and occupations are seen as part of the resources available to the learners and this is also included. The findings reported in this chapter are based upon the questionnaire data received from the learners tested and their parents. It is important to note that the study was sensitive to the complexities of households in South Africa and therefore care was given to be inclusive of the households with varying profiles of "parenthood" in the home– guardians, caregivers, single parents and child-headed households.

Finally, Chapter 10 summarises the PIRLS 2016 and its results and findings. The conclusions and recommendations are discussed in this chapter.

CHAPTER 2: LANGUAGE AND LITERACY IN SOUTH AFRICA

Nelladee McLeod Palane and Sarah Howie

2.1 Introduction

In this section, language-in-education complexities are explored (2.2) and the reading theory undergirding the large-scale PIRLS Literacy assessment is outlined (2.3). The approach to language and reading instruction in the South African curriculum (CAPS) is described (2.4). Lastly, in Section 2.5, the cognitive processes (levels) that form the basis of the PIRLS Literacy assessment are explained and discussed in terms of how they relate to South Africa's assessment requirements for the different language proficiency levels.

2.2 Language in South Africa

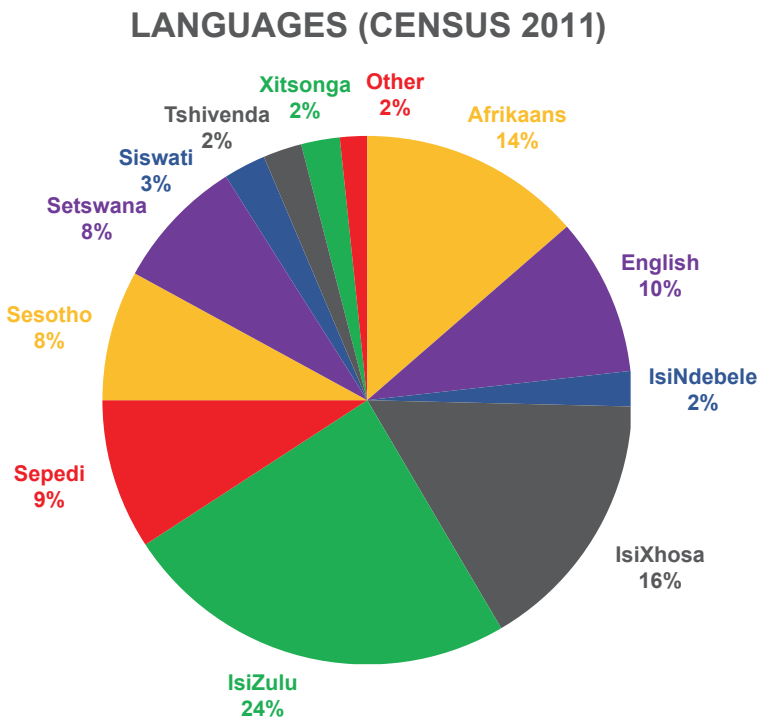
The decolonisation of Africa has left in its wake a complex and emotive debate on language-in-education. Wading into a part of this debate, van der Walt and Evans ask the question 'Is English the Lingua Franca of South Africa?' (van der Walt & Evans, 2017). Underscoring the fact that South Africa is a multilingual country, van der Walt and Evans (2017) explain that according to international visitors and most of the middle class, English is the language of prestige, but is arguably not worthy of the title 'lingua franca' since it is the mother tongue of less than 10% of the population. Nonetheless, when one examines its prevalent use in Government departments, the courts and the media (van der Walt & Evans, 2017), a contradiction emerges. The low level of reading achievement observed relative to other countries in the previous PIRLS large-scale assessments has often been attributed to the complexity of South Africa's language-in-education policies. However, contextual factors such as access to educational resources and schooling conditions (Howie, McLeod Palane, Roux, Combrinck & Tshele, 2017) weigh in on straightforward explanations that erroneously seek to exclusively blame the language-in-education problem for the low level of achievement.

By way of an interesting comparison, the case of the Russian Federation, which was the highest performing country grouping in this round of PIRLS could be considered and, like South Africa, faces complexities with regard to language. The Russian Federation, however, has one official state language, namely Russian. According to the PIRLS 2016 Encyclopaedia, all the republics of the Federation have the right to have their own official language (and there are 37 official languages in these republics); however, it is stipulated that teaching and learning the official languages of the republics should not be done at the expense of teaching and learning the official language of the Russian Federation. Russia's population speaks 239 languages and dialects. The citizens of the Russian Federation have the right to receive preschool, elementary and secondary education in their native language if it qualifies as one of the languages of the people of the Russian Federation. However, as in South Africa, the delimitation of this freedom is that this right be balanced by the capacity of the national education system to deliver

education in the desired languages. Notably, according to the PIRLS 2016 Encyclopaedia, the number of schools with instruction in one of the native languages of the Federation has grown significantly in some regions of Russia in recent years. This is an interesting development when viewed from the seeming impasse that South African education has reached with regard to the language of instruction.

Making it a prerequisite that all South African learners from urban to rural settlements receive adequate and the same high quality instruction of English (McLeod Palane, *in press*) whether as a Home Language or a First Additional Language (FAL) across the board from the beginning of school regardless of the language that they select as their language of instruction, might make a good starting point in the prioritisation of access and internationalisation. It seems evident that learners will need to embrace the goal of being a 'global citizen' if they are to benefit fully from the twenty-first century skill set. Along with this is the need to standardise and improve the Home Language and FAL curriculum offering across all the African languages. Of utmost importance is the need to provide text in the form of educational resources for the learners in all the languages since access to text has been shown to provide even low socio-economic learners with a significant advantage (McLeod Palane, *in press*) and to successfully encourage learners to engage with the available text. Russia is well-known for its plethora of classical literature and is arguably viewed as a reading nation. Using their example, the first step may be to give all South African learners the same opportunity to access resources and a global national language whilst teaching learners to identify the cultural bias hidden in literature and empower them to challenge the dominant cultural discourse. Nonetheless, this first step is just scaffolding – a link in the chain to ensuring the realisation of a multilingual country with a multicultural literary richness that cultivates critical thought in classrooms, which is a central tenet of twenty-first century skills.

South Africa's Constitution recognises eleven official spoken languages (prior to 1993, English and Afrikaans were the only two official languages in the country). Based on the 2011 Census (see Statistics South Africa, 2012), there are 51.7 million South African citizens of which the largest group (24%) speak isiZulu followed by isiXhosa (16%) and Afrikaans (14%). English, although by many considered the main language of business and government, is spoken by only 10% of the population.



Source: Census, 2011

Figure 2.1: Distribution of South African Languages in the Population

The remaining seven languages (isiNdebele, Sepedi, Sesotho, Setswana, siSwati, Tshivenda and Xitsonga) are spoken by fewer than 10% of population, In addition to the eleven official spoken languages, sign language, Tsotsitaal, Fanagalo and the languages associated with the Khoisan population, such as !Xun and Kwedam, are recognised. International languages such as Arabic, Italian, Spanish, Gujarati, Hindi, Tamil, Telegu, French, German, Hebrew, Portuguese, Serbian and Urdu are also found and learnt across the country and also are examined nationally in secondary school exit examinations, as is Latin.

The Constitution of 1996 specifies that all children in South Africa have the right to be educated in their own language. In 1997, The Department of Education's Language-in-Education Policy (LiEP), guided by the Constitution and the South African Schools Act, recommended that the learners' first language be used for teaching and learning where possible, especially in the Foundation Phase (Grades R–3).

Higher-order learning as stipulated in the curriculum will be possible when adequate resources are available in the classroom that broaden the thinking of the learner and develop their grasp of the language and their ability to convey their thinking in writing. Language (in the home and in the classroom) and contextual factors (in the home and at school) in education have an interactive effect on learner development of higher-order cognition for reading achievement (McLeod Palane, *in press*). The more learners are exposed to good resources, the more they will have an opportunity to develop their literacy, as well as their language competence. According to Vygotsky (1978) the socio-cultural context and access to mediation in, for example, the form of text develops learners' higher-order thinking, which includes metacognitive processes and critical thinking, and are recognised as 21st century skills.

2.3 Reading Theory in PIRLS

The PIRLS 2016 Assessment Framework (Mullis & Martin, 2013) states that readers construct meaning in different ways and reading literacy is viewed as a constructive and interactive process (Chall, 1983, Kintsch, 2013, Rumelhart, 1975) where meaning is constructed through the interaction between reader and text (Snow, 2002). During the process of actively constructing meaning, the reader draws on a repertoire of effective reading strategies and reflects on the reading experience (Afflerbach & Cho, 2009). In addition, the prior experience and background knowledge that a learner brings to a text plays an important role in their understanding of the text (Klapwijk, 2011).

PIRLS assesses four broad-based cognitive processes of comprehension typically used by fourth grade readers. These processes are further undergirded by the metacognitive processes and strategies that allow readers to evaluate their understanding and regulate their use of reading strategies. The use of reading strategies aids higher-order reading comprehension in the learner. Reading strategies can be separated into cognitive reading strategies and metacognitive reading strategies (Keer, 2004). Cognitive strategies are mental and behavioural activities. During cognitive strategies, learners use existing knowledge, make use of re-reading, and alter reading speed to aid comprehension. Metacognitive strategies are self-monitoring and self-regulating activities (Flavell, 1976; Keer, 2004; Simons, 1994) and metacognition generally refers to the awareness, monitoring and self-regulating of cognitive strategies. Metacognitive strategies are evident when a learner is aware of applying a certain cognitive strategy and of their own cognitive abilities (Keer, 2004).

2.4 Curriculum and Assessment Policy

The Curriculum and Assessment Policy Statement (CAPS), which is the national curriculum, emphasises the importance of student proficiency in at least two languages and being able to communicate in others. The language-specific curricula follows an additive approach to multilingualism, namely, all students learn a language on a "home language" level (which for most would be their home language) and at least one additional official language, and become competent in their additional language on a second-language level, while the home language is maintained and developed. A relatively new development is that schools, not offering an African language as the language of learning and teaching (LoLT), should introduce an African language in Grade 1. The incremental introduction of African Languages in South African Schools draft policy of 2013 stipulates that an African language be introduced from Grade 1 onwards as second First Additional Language. One of the main goals of the policy is to "promote and strengthen the use of African languages" (DBE, 2013, p.5). The policy was piloted in 2014 across eight provinces and in 228 schools. At this stage the pilot has not grown to scale nationally.

The language subject area includes all (11) official languages as home languages, first additional languages, and second additional languages (e.g. French, Arabic or Greek amongst others used primarily for interpersonal and societal purposes). Whilst CAPS states that the learners' home languages should be used for learning and teaching, the reality in practice

is that about 80% of learners have to change to a language that is not their home language in Grade 4. Seven hours per week is allocated to language instruction, four and a half hours is dedicated to phonics, shared reading and group reading. The curriculum recognises that all learners must be taught strategies that help them to decode written text and to read with understanding. Learners should also learn to interpret pictures and other graphics to make sense of visual and multimedia texts. They should know how to locate and use information, follow a process or argument, summarise, develop their own understanding, and adapt and demonstrate what they learn from their reading. These skills are similarly reflected in the PIRLS assessment items. The curriculum also recommends that classroom be a "print rich" environment. In the current environment of under-resourcing, this goal falls short as is seen in Chapter 8 on the classroom environment.

The curriculum aims to produce learners who are able to do the following: collect, analyse, organise, and critically evaluate information and communicate effectively using visual, symbolic, and language skills in various modes. The National Curriculum Statement Grades R-12 "gives expression to the knowledge, skills, and values worth learning in South African schools" (Department of Basic Education, CAPS, p.4). Language learning includes all the official languages. In Grade 4, these languages are offered either at Home Language or First Additional Language levels. The curricula for Home Language and First Additional language differentiate the proficiency level at which the language is offered. Emphasis is placed on the teaching of listening, speaking, reading and writing skills appropriate to either level. CAPS states that at the First Additional Language level, the "curriculum provides strong support for those learners who will use their first additional language as a language of learning and teaching" (Department of Basic Education, CAPS, p.8). The First Additional Language CAPS take advantage of learners' literacy skills in their home language. "For example, activities such as guided reading that are introduced in the Home Language CAPS in Grade 1 are introduced in the First Additional Language CAPS in Grade 2" (Department of Basic Education, CAPS, p.9). In this way, the curriculum embraces 'additive bilingualism' by aiming to develop a strong literacy foundation in the Home Language and building First Additional Language literacy onto this foundation.

In South Africa, many children start using their additional language, English, as the language of learning in Grade 4, which means that they need to reach a high level of competence in reading and writing English by the end of Grade 3. The Grades 4-6 or Intermediate Phase provides learners with literary, aesthetic, and imaginative competencies that will enable them to recreate, imagine, and empower their understandings of the world in which they live. Listening, speaking, and language usage skills are further developed and refined but with an emphasis on reading and writing skills, which are considered central to successful learning across the curriculum (DoE, 2010). The curriculum expectations of the Intermediate Phase (Grades 4-7) are congruent with the assessment items found in PIRLS in that during the Intermediate Phase, learners are expected to further develop their proficiency in reading and viewing both literary and non-literary texts, including visual ones, and learners must be able to recognise genre, and reflect on the purpose, audience and context of texts. Through classroom and independent reading, learners in this phase learn to become critical and creative thinkers. Listening and speaking receive less emphasis than reading and writing skills from Grade 7 onwards.

CAPS places the responsibility on teachers to differentiate reading levels and to select appropriate reading materials that will effectively support learners. Course readers are considered important for reading instruction, while authentic reading material (library books and other real-life texts) are used to develop higher levels of reading (i.e., independent reading). CAPS is also specific in providing teachers with instructional plans that contain the minimum content to be covered over two-week blocks.

CAPS provides teacher guidelines on the development of a language lesson. It suggests that pre-reading activities should be used to prepare learners for reading. Typical pre-reading activities include discussion of the text title, predictions about story content, and using keywords from the text to engage learners even before starting to read. The curriculum encourages teachers to interrupt reading sessions by looking back at the text in order to verify whether predictions were accurate, or to discuss why things did not develop in the way learners had predicted. At the same time, further predictions could be made about the story. Teachers are advised to engage learners in reflection following reading. Literal questions could be asked, leading to more complex and abstract answers based on inferences made from the text. Learners could be asked to re-tell, dramatise, or critically discuss the text by focusing on values, messages, or cultural or moral issues conveyed in the text. Other activities include comparing the current text to other texts they have read independently, or showing differences and similarities between texts.

2.5 Assessment of Cognitive Levels for Comprehension in CAPS and PIRLS Literacy

In CAPS Grades 1-3 (Foundation Phase) and Grades 4-6 (Intermediate Phase) at Home Language level, both lower order and higher order cognitive levels of reading comprehension are emphasised. The Additional Language curriculum for the Foundation Phase suggests that an important way of developing children's reading comprehension is by asking questions that enable learners to engage with the text. The teacher begins with simple questions and gradually (as learners get used to question forms and develop the language necessary to answer them) asks more complex questions with the requirement being that by the time learners are in Grade 3 they should be able to answer 'Why…?' questions. Conversely, the Home Language curriculum for the Foundation Phase makes more complex cognitive demands and requires instruction in reading comprehension that provides the learners with the opportunity to engage in a range of levels of thinking and questioning across the lower and higher order comprehension skills, including the cognitive levels of literal comprehension, reorganisation, inferential, evaluation and appreciation. Teachers are also guided to work on metacognitive skills to teach learners to monitor themselves when reading.

In the Intermediate Phase, the percentage assessment requirements allocated to lower and higher order cognitive levels is the same for both the Home language and Additional Language levels. Literal (cognitive level 1) and reorganisation (cognitive level 2) are required to make up 40% of a reading comprehension task, inference (cognitive level 3) should make up a further 40% of comprehension task with evaluation (cognitive level 4) and appreciation (cognitive level 5) making up the last 20% of a comprehension assessment.

A similar structure that facilitates the process of moving from lower order (retrieval of information or cognitive levels 1 and 2) to higher order (making inferences, integrating information and evaluating text or cognitive levels 3, 4 and 5) questioning is observed in the PIRLS assessments. The two reading purposes and four comprehension processes form the basis for assessing PIRLS and PIRLS Literacy; however, there are some differences in emphases across the assessments. Table 2.1 from Mullis and Martin (2013, p.16) below shows the percentage spread of purpose and processes for the two studies.

Table 2.1: Percentages of Items Assessing Different Purposes for Reading and Processes of Comprehension

	PIRLS	PIRLS LITERACY
Purposes for Reading		
Literary Experience	50%	50%
Acquire and Use Information	50%	50%
Processes of Comprehension		
Focus on and Retrieve Explicitly Stated Information	20%	50%
Make Straightforward Inferences	30%	25%
Interpret and Integrate Ideas and Information	30%	25%
Evaluate and Critique Content and Textual Elements	20%	

In the PIRLS assessments, the four comprehension processes are used as a foundation for developing the comprehension questions which are based on each reading passage. For each assessment, the questions are varied in order to measure the range of comprehension processes. The length and complexity of a text also has bearing on the complexity of the comprehension process. It is important to note that although locating and extracting explicitly stated information appears to be less difficult than making interpretations across an entire text, all texts are not equal and can vary with regard to length, syntactic complexity, abstractness of ideas, and organisational structure which impacts the difficulty of the question asked across the four types of comprehension processes (Mullis & Martin, 2013).

2.5.1 Focus on and Retrieve Explicitly Stated Information

In focusing on and retrieving explicitly stated information, readers use various ways to locate and understand content that is relevant to the question. Items testing this process require the reader to focus on the text at the word, phrase and sentence level for the purpose of constructing meaning. The process may also require the reader to focus on and retrieve pieces of information from across the text (Mullis & Martin, 2013).

The PIRLS 2016 Assessment Framework outlines the range of the focus on and retrieve process as follows:

- Identifying information that is relevant to the specific goal of reading;
- Looking for specific ideas;
- Searching for definitions of words and phrases;
- Identifying the setting of a story (e.g., time and place); and
- Finding the topic sentence or main idea (when explicitly stated) (Mullis & Martin, 2013, p. 21).

This is an excerpt from released prePIRLS literary passage 'Brave Charlotte' by Anu Stoher:

Charlotte lived with all the other sheep on a hillside far from the farm. They had a shepherd to look after them and he had an old dog named Jack (Mullis & Martin, 2013, p.140).

Example Item (Focus on and retrieve information):

1. Who is Jack?

Example of scoring guide:

1- Acceptable response

The response indicates that Jack is a dog / old sheep dog

2.5.2 Make Straightforward Inferences

The ability to 'make straightforward inferences' that are not explicitly stated allows readers to move beyond the surface of texts and to resolve gaps in meaning. Some of these inferences are straightforward in that they are based primarily on information that is contained in the text and readers must connect two or more ideas. The ideas themselves may be explicitly stated, but the connection between them is not, and must, therefore, be inferred. However, despite the inference not being explicitly stated in the text, the meaning of the text is understood. Skilled readers will connect two or more pieces of information and recognise the relationship even though it is not stated in the text (Mullis & Martin, 2013).

As stated in the PIRLS 2016 Assessment framework, with this type of processing, the focus may be on local meaning residing within one part of the text, the focus may also be on a more global meaning, representing the whole text. Reading tasks that may exemplify this type of text processing include the following:

- Inferring that one event caused another event;
- Concluding what is the main point made by a series of arguments;
- Identifying generalisations made in the text; and
- Describing the relationship between two characters (Mullis & Martin, 2013, p.22).

This is an excerpt from released prePIRLS literary passage 'Brave Charlotte' by Anu Stoher:

When all the other sheep were sleeping, she would slip away to her special place and gaze at the moon. Even Jack did not notice. But he did not have very good ears these days (Mullis & Martin, 2013, p.142).

Example of Item (Make straightforward inferences):

5. Why didn't Jack notice when Charlotte went out at night?

Example of Scoring Guide:

1- Acceptable Response

The response indicates that Jack did not notice Charlotte because he could not hear very well.

2.5.3 Interpret and Integrate Ideas and Information

As with the more straightforward inferences, readers who are engaged in interpreting and integrating ideas and information in text may focus on local or global meanings. As readers interpret and integrate they construct meaning by integrating personal knowledge and experience with meaning that resides within the text. In this way, readers draw on their understanding of the world, as well as their background knowledge and experiences, more than they do for straightforward inferences and make connections that are not only implicit, but that may be open to some interpretation based on their own perspective (Mullis & Martin, 2013).

The PIRLS 2016 Assessment framework describes these reading tasks as:

- Discerning the overall message or theme of a text;
- Considering an alternative to actions of characters;
- Comparing and contrasting text information;
- Inferring a story's mood or tone; and
- Interpreting a real-world application of text information (Mullis & Martin, 2013, p.23).

This is an excerpt from prePIRLS informational passage 'Caterpillar to Butterfly' by Deborah Heiligman:

Our butterfly could not stay in the jar. It needed to be outside with flowers and grass and trees. We watched our butterfly land on a flower. It sipped the flower's nectar through a long, coiled tube. Maybe it was a female butterfly. Maybe someday she would lay an egg on a leaf (Mullis & Martin, 2013, p.178).

Example of item (Interpret and Integrate ideas and information):

15. Put what happens to a caterpillar as it changes into a butterfly in the correct order. The first one has been done for you.

___ The caterpillar forms a hard shell.
_1_ The caterpillar eats and grows.
___ The butterfly flaps its wings.
___ The shell of the chrysalis cracks.

Example of scoring guide:

_2_ The caterpillar forms a hard shell.
_1_ The caterpillar eats and grows.
_4_ The butterfly flaps its wings.
_3_ The shell of the chrysalis cracks.

2.5.4 Evaluate and Examine Content, Language and Textual Elements

According to Mullis and Martin (2013), as readers evaluate the content and elements of a text, the focus shifts from constructing meaning to critically considering the text itself. Readers engaged in this process step back from a text in order to examine and critique it.

In evaluating and critiquing elements of text structure and language, readers draw upon their knowledge of language usage to reflect on and judge the author's language choices and devices for conveying meaning. Using past reading experience and familiarity with the language and text structure, readers evaluate the visual and textual features used to organise the text (Mullis & Martin, 2013).

The tasks encapsulating this process are outlined in the PIRLS 2016 Assessment Framework:

- Judging the completeness or clarity of information in the text;
- Evaluating the likelihood that the events described could really happen;
- Evaluating how likely an author's argument would be to change what people think and do;
- Describing the effect of language features, such as metaphors or tone; and
- Determining an author's perspective on the central topic (Mullis & Martin, 2013, p.24).

This is an excerpt from prePIRLS informational passage 'Caterpillar to Butterfly' by Deborah Heiligman:

Our butterfly could not stay in the jar. It needed to be outside with flowers and grass and trees. We watched our butterfly land on a flower. It sipped the flower's nectar through a long, coiled tube. Maybe it was a female butterfly. Maybe someday she would lay an egg on a leaf (Mullis & Martin, 2013, p.178).

Example of item (Evaluate and examine content, language and textual elements):
16. Think about the whole article. Why do you think the teacher brought the caterpillar into the classroom?

Example of scoring guide:
The response recognises that the teacher brought the caterpillar in to class for students to see it change/grow (into a butterfly) OR the response may indicate a general understanding that the teacher wanted students to learn about butterflies or about the caterpillar's cycle of life.

2.6 Conclusion

Taking into account the purposes and processes of comprehension required by the PIRLS assessments, teachers need to consider the implications this has for teaching according to CAPS in the classroom. The PIRLS reading comprehension processes can be used as guidelines for teaching reading literacy in the early grades. Previous PIRLS studies have alerted the Department of Basic Education to the need for more challenging reading materials for young readers and to the obstacles South Africa faces in reading literacy.


PIRLS 2016
Fundela ukuzithokozisa
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CHAPTER 3: RESEARCH DESIGN AND METHODS IN PIRLS LITERACY 2016

Celeste Combrinck, Karen Roux, Mishack Tshele, Gabriel Mokoena and Nelladee McLeod Palane

3.1 Introduction

An overview of the PIRLS Literacy research design and methodology, as applied in South Africa, is described in Chapter 3. Differences to the international study are noted but generally all international procedures were followed, complied with and quality assured. For more information on the international study, see the TIMSS and PIRLS International Study Centre[11] webpages. An encyclopaedia is also available (see Mullis, Martin, Goh & Prendergast, 2017) which includes a chapter for each country (see for South Africa, Howie, Combrinck & Roux, 2017). Martin, Mullis and Hooper (2017) provide detailed information on the PIRLS 2016 study in their Methods and Procedures[12] publication.

South Africa was one of 50 countries participating in PIRLS 2016. An additional 11 benchmark participants also took part (TIMSS and PIRLS International Study Centre, 2017). In each of the 50 countries, a representative random sample of classes was tested. In terms of the benchmark participants, one or more test populations was chosen (province, language etc.), and as a result, their data are not representative of the entire country. South Africa had a fully representative sample for Grade 4: that means the sample is representative of the 11 officially spoken languages and also representative of the nine provinces. At the Grade 5 level, South Africa was a benchmark participant and chose representative samples of English, Afrikaans and isiZulu schools which are also representative of provinces.

This chapter provides a broad overview of the Grade 4 PIRLS Literacy study and how it was implemented in the South African context. The international conceptual framework underlying the study is described as well as the broad research questions (see also Mullis & Martin, 2015). This chapter also includes the methods, sampling, research instruments, translation and data collection methods, how the data were captured, scoring of the open-ended achievement instruments and the data processing and quality assurance procedures. The international study utilises sophisticated methods that have been developed over the course of the last 50 years or more, and relies on statistics and psychometric models, developments in the reading comprehension discipline and research methodology developed specifically for large-scale assessment studies. At the heart of the study is the globally recognised tenet that reading and comprehension skills are pivotal to function in a modern society.

[11] https://timssandpirls.bc.edu/pirls2016/index.html
[12] https://timssandpirls.bc.edu/publications/pirls/2016-methods.html

3.2 International Conceptual Framework: PIRLS Literacy 2016

The PIRLS framework defines reading literacy as being able to understand written works required for functioning as an individual and as part of a society (Mullis & Martin, 2015). The conceptual framework is shown in Figure 3.1 below.

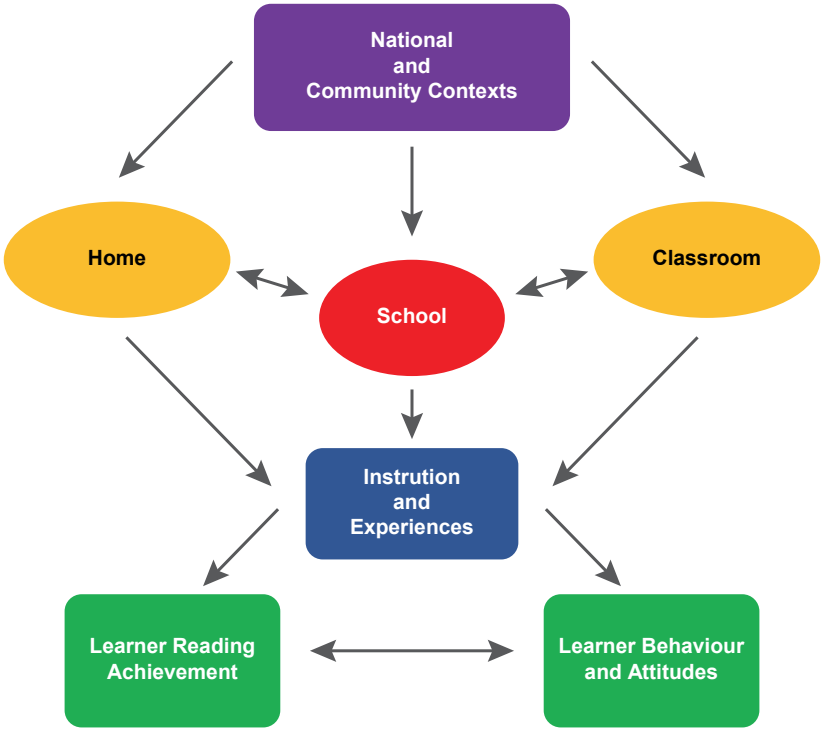


Figure 3.1: Conceptual Framework for the PIRLS 2016 (from Mullis et al., 2009)

In order to function in a society, a reader must be able to retrieve information from a text, interpret what they read, evaluate the information and apply it in a variety of contexts (Britt, Goldman & Rouet, 2012). The acquisition and development of reading literacy is influenced by home, school, classroom and broad societal factors. The international PIRLS framework is based on the direct or indirect association of home, learner, classroom, school and society factors with reading literacy achievement (Mullis & Martin, 2015).

3.3 National Research Objectives

Overall the study aimed to assess how well learners at the Grade 4 level comprehend a text when compared to the international benchmarks and standards. The specific research objectives for PIRLS Literacy are described below:

1. To assess the overall reading comprehension achievement and benchmarks reached for Grade 4 learners in South Africa, in 11 of South Africa's official languages and in nine provinces;
2. To assess Grade 4 learner comprehension levels in relation to curriculum objectives for reading education;

3. To assess the potential impact of the home environment and school conditions on Grade 4 learner performance and the role of parents in reading achievement;
4. To assess classroom approaches to and strategies for the teaching of reading in Grade 4, taking into account time and reading materials for instruction;
5. To assess policy implementation regarding curriculum and infrastructural development in schools at Grade 4 level;
6. Link PIRLS Literacy to PIRLS so that the Grade 4 achievement can be compared to the full PIRLS international scale and the benchmarks; and
7. To track long-term trends in reading literacy at Grade 4 level.

3.4 Study Design and Methods

PIRLS is designed as a Trend study and this determines the design and utilisation of the specific methods to be used. In order to measure trends, countries therefore need to participate in multiple cycles of PIRLS. South Africa has participated in three cycles: 2006, 2011 and 2016. However, due to changes in the national design in 2011, only the questionnaire data (contextual items) is comparable across the three cycles for all the languages at the Grade 4 level. Here it is important to note that some questionnaire items changed from one cycle to the next and only items that remained the same in each cycle should be used for comparison. Table 3.1 below shows comparisons possible for the Grade 4 cohorts across the cycles.

Table 3.1: Comparisons Possible Across Groups (Trends)

	2006, 2011 & 2016	2006 & 2016	2011 & 2016
Grade 4	• Nationally representative contextual data for all 11 languages* • Achievement and context data for Afrikaans and English*	• Achievement and context data for Afrikaans and English languages and 9 provinces	• Achievement and context data for all 11 languages (not provinces)

*Languages cannot be compared within provinces

The 2011 and 2016 cycles offer the opportunity to compare the Grade 4 achievement results for all 11 languages as well as contextual data for questionnaire items that remained the same (see Table 3.1). This comparison gives an indication of potential changes that have been taking place in literacy development in the five years between the cycles. It offers an important indicator of progress being made in mother-tongue instruction.

3.4.1 Population and Sampling: PIRLS Literacy 2016

The population for selection was the South African Grade 4 learners. Selection is done firstly based on the Language of Learning and Teaching (LoLT) in Grade 1 to 3 (Foundation Phase). Therefore, more learners may be selected from certain areas as that is where the language is mostly spoken and where the schools for that language are located. A random sample of schools was selected to be representative of language and province. Results reported in Chapters 4 to 9 are representative of the South African Grade 4 population (weighted percentages). There are also implicit strata which impact the final sample:

- European-based languages (Afrikaans and English)
- African languages (9 official South African languages)
- Schools with European-based and African languages
- Schools with multiple European-based languages
- Schools with multiple African languages

The many permutations explain why so many English schools were included.

In 2006, all 11 languages were tested at the Grade 4 and Grade 5 level but the average performance was well below the Lowest Benchmark and did not provide adequate information about reading literacy for South African Grade 4 learners, more especially those learners writing in an African language. Subsequently, in 2011 South Africa participated in the easier version of PIRLS, at that time named prePIRLS, at Grade 4 for all 11 languages. As in previous rounds of PIRLS, a two-stage stratified cluster sampling design was used to select the samples for PIRLS Literacy. In Stage 1 of the PIRLS Literacy study, schools were sampled in proportion to size, followed by the second stage of randomly sampling classrooms. PIRLS Literacy 2016 was sampled to be representative of province and language, respectively but not together. The sampling was also set up to maximise the benefit of the sample, as far as possible sampling schools for both PIRLS and PIRLS Literacy together (82 common schools). Figure 3.2 shows the Grade PIRLS Literacy sample in the context of the PIRLS study as a whole.

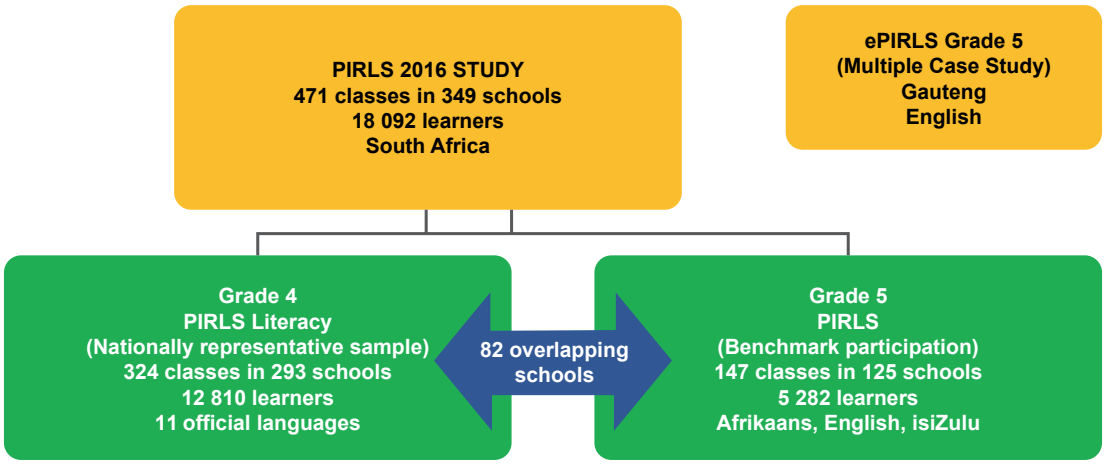


Figure 3.2: The South African Grade 4 PIRLS Literacy Sample in context of the broader sample

A total of 304 schools were sampled to participate in PIRLS Literacy 2016 by Statistics Canada from the sampling framework based upon the EMIS dataset. The EMIS data was combined with data about language implementation in the Foundation Phase in schools obtained from the Department of Basic Education. A two-stage stratified random cluster sample was implemented meaning that first the schools were randomly selected from the sampling frame and a nationally representative sample of schools was chosen according to province and to language that was used from Grade 1-3 as the LoLT as PIRLS Literacy was administered to learners who had had exposure to the language for four years. The second stage was to

select a class (cluster) within a school randomly. All the learners in that class were selected to participate unless there was a problem with their eligibility.

PIRLS 2016 was a voluntary study and schools were not obliged to participate. Each school had a first and second replacement school with the same characteristics in the event a school refused to participate. This occurred with some of the schools (11 schools) that refused to participate and were replaced. A total of another 11 schools were not able to participate because the schools did not have the target grade, or the schools had closed down, or were unreachable (these schools were not replaced). Table 3.2 presents the number of schools that were selected to participate as well as those that did participate per province. Within the 304 schools that were selected for participation, a total of 293 schools were assessed.

Table 3.2: PIRLS Literacy Grade 4 Sample of Schools per Province

Province	Number of Schools Selected for Participation	Number of Schools Participated	Percentage of Schools Participated
Eastern Cape	31	31	100%
Free State	23	22	96%
Gauteng	37	35	95%
KwaZulu Natal	35	34	97%
Limpopo	53	51	96%
Mpumalanga	48	46	96%
North West	25	24	96%
Northern Cape	24	22	92%
Western Cape	28	28	100%
South Africa	**304**	**293**	**96%**

Table includes replacements

After contacting the participating schools, only 330 classes were deemed eligible for participation. This occurrence was mainly because of the misreporting of the number of languages in the Foundation Phase in certain schools. Accordingly, 324 classes were tested as part of the study. Table 3.3 illustrates the number of classes participating in the study per province.

Table 3.3: PIRLS Literacy Grade 4 Sample of Classes per Province

Province	Number of Classes Selected for Participation	Number of Classes Participated	Percentage of Classes Participated
Eastern Cape	33	33	100%
Free State	31	30	97%
Gauteng	45	42	93%
KwaZulu Natal	35	34	97%
Limpopo	56	53	95%
Mpumalanga	51	48	94%
North West	25	24	96%
Northern Cape	26	23	88%
Western Cape	37	37	100%
South Africa	**339**	**324**	**96%**

Table 3.4 shows the breakdown of the classes tested by language. Breakdown per school for

languages is not shown as languages were in some cases sampled from the same schools (schools with more than one LoLT at Foundation Phase). Of the 324 classes, most (57) classes were selected from English LoLT schools followed by isiZulu LoLT classes (46).

Table 3.4: PIRLS Literacy Total Number of Classes Tested by Language

Language	Number of Classes Eligible for Participation	Number of Classes Participated	Percentage of Classes Participated
Afrikaans	42	38	90%
English	60	57	95%
isiNdebele	7	7	100%
isiXhosa	35	35	100%
isiZulu	48	46	96%
Sepedi	23	21	91%
Sesotho	27	27	100%
Setswana	31	30	97%
siSwati	22	21	95%
Tshivenda	22	22	100%
Xitsonga	22	20	91%
South Africa	**339**	**324**	**96%**

For a full list of Languages tested per province see Appendix A.

3.4.2 Assessment Instruments: PIRLS Literacy 2016

The assessment instruments were designed to be administered in the languages that learners were exposed to for four years. In the South African context, this meant that learners were tested in the language in which they had received instruction from Grades 1 to 3 and then for most learners, the Home Language taken in Grade 4.

As PIRLS used a rotated test design, the design of the assessment instruments included 12 passages in various combinations. Of the 12 passages, six were trend passages. The 6 trend passages consisted of four prePIRLS passages and two PIRLS passages. The PIRLS passages created a vital link between the PIRLS and PIRLS Literacy studies which enabled the IEA to align the PIRLS Literacy results with the PIRLS international scale. The PIRLS Literacy passages (both literary and informational) were accessible to the less proficient reader as they were broken up into manageable sections. This meant that the learner read a short section of text and then answered one or two questions based on the section just read before returning to read the next short section and, in this way, was able to work in stages through the full text and all of the items. PIRLS Literacy passages were shorter and less complex than PIRLS passages. The PIRLS Literacy passages were also in a larger font than that of PIRLS, and had the look and feel of a story or informational passage aimed at a younger reader.

In PIRLS and PIRLS Literacy, literary (narrative-based texts) and informational texts assessed two Purposes for Reading: that is, *reading for literary experience* and *reading for the use and acquisition of information* with each comprising 50% of the assessment. Within each of these two purposes, four Processes of Comprehension were identified (Mullis & Martin, 2015). The learner is required to:

- Focus on and retrieve explicitly stated information
- Make straightforward inferences
- Interpret and integrate ideas and information; and
- Examine and evaluate content, language and textual elements

Important Note Regarding Scaling: *The scaling of PIRLS and PIRLS Literacy was done conjointly but the international achievement scale was fixed to the PIRLS common item difficulties. In 2011, the prePIRLS achievement results could not be placed on the PIRLS scale as yet and was seen as a separate measurement. In 2016, there were common passages between PIRLS and PIRLS Literacy, creating the opportunity to place both studies on the same scale using Item Response Theory. The PIRLS Literacy achievement data for both 2011 and 2016 have been rescaled to be on the PIRLS measurement scale aligned to the international standard. This means there is one scale of measurement, but two ways a child can be placed on the scale: either from PIRLS which has more difficult passages and/or from PIRLS Literacy which has easier passages. PIRLS Literacy may provide more information for children with lower reading ability as they may be more able to access the items and secondly, more motivated to complete an easier version of the test.*

3.4.3 Contextual Questionnaires for PIRLS Literacy 2016

The questionnaires were designed to collect information related to the reading behaviour of learners and attitudes of learners, parents, teachers and school principals towards education and reading in general in addition to contextual information about homes, classrooms and schools. As part of the new assessment cycle, the National Research Co-ordinators (NRC) reviewed the aforementioned questionnaires to ensure that the items align with the goals for each questionnaire. Thereafter, the TIMSS and PIRLS International Study Centre updated the draft questionnaires based on the NRC reviews which were then discussed at the Questionnaire Development Group (QDG) meeting for final review and modification.

The *Learner Questionnaires* included questions about the attitudes to reading and reading habits, in addition to collecting information about their experiences, and their home and school environment. The *Parent Questionnaire* asked parents or primary caregivers about their demographics, attitude to reading, the early home activities conducted with their child as well the quality of the relationship between the parent and the school. The *Teacher* and *School Questionnaires* asked about school and classroom environments, the attitudes of the principal and the teachers as well as other related factors such as the qualification, years of experience, teacher professional development and job satisfaction of the teacher(s).

Participating countries had the opportunity to add National Options to the four questionnaires. National Options are additional contextual items added to relevant sections of the questionnaires, and in the South African study, National Options allowed for more insight into the South African educational and social landscape.

The *Curriculum Questionnaire* was completed by the NRC together with assistance from others. Questionnaires related to the language curriculum content and reading on system level are asked. This is to provide the vital context for understanding the achievement results.

3.4.4 Translation of Instruments in South Africa

A certified translation company was contracted to translate the instruments as well as to adapt the international US English version to the UK English. The translation processes were protracted due as the subtleties and nuances of the passages, the immense challenges of translating six PIRLS Literacy passages into 10 of the official languages and adapting the international version for the South African context, as well as the changes made as a result of the international meeting held in Finland in 2015. The late release of the instruments made translation especially problematic for the South African team and resulted in only six weeks to translate, back translate, complete translation verification, complete formatting and layout, layout verification prior to the printing of instruments. Grade 4 language teachers (language of the test) were recruited and they reviewed passages for appropriateness of translation and difficulty for Grade 4. The final translations were based on the decision from the official translators as the translation company used certified language practitioners.

In addition, all new PIRLS passages were translated, back translated, translations verified and proofread against English versions in this restricted period. A total of six PIRLS Literacy passages were translated and underwent a rigorous process of verification. It is also important to note that the trend passages could not be drastically changed, as too many changes would invalidate the link between the studies (2006, 2011 and 2016). Modifications or refinements to trend passages and items were extremely limited in order to protect the link between the studies. The main aim of the translations was to create equivalent versions across all the languages. Crafting equivalent versions of an existing English version in other languages is immensely difficult as phrases and vocabulary may not be available in some of the languages, especially the minority languages. The translation team endeavoured to translate content as accurately and fairly as possible but also acknowledged that languages are qualitatively different from one another in ways for which translation cannot account. The translated instruments were sent to the IEA international partners for translation verification. The translation verification required the international partners to select local translators in South Africa to check the quality of the translations. The translation verification then resulted in comments and suggestions which the South African language specialists implemented in conjunction with local translators.

The *School* and *Teacher Questionnaires* were translated into Afrikaans, whilst the *Learner* and *Parent Questionnaires* were translated into the 10 other official languages. The questionnaires underwent thorough translation verification and extensive quality assurance processes. As part of quality assurance of the questionnaires, an experienced team of language experts meticulously reviewed each item for translational equivalence across the different languages. Where there seemed to be a discrepancy in the translations, the language expert, together with the questionnaire co-ordinator, conducted a follow-up review of the specific item(s) and made informed final decision(s) about the item(s).

3.4.5 Formatting and Preparation of Instruments

After translation verification had been completed, the files were imported and formatted in *InDesign*. After the passages were formatted in *InDesign*, they were returned to the translators for proofreading. The assessment instruments comprised 15 different types of booklets with each passage appearing in three booklets. In addition, a reader, which contains two passages not repeated in any of the other booklets, formed part of the set of instruments. The reader was printed in colour and left at the school as a resource for the teacher. To create 16 booklets for each of the 11 languages resulted in the creation of 176 different types of instruments. The questionnaires required the creation of 22 instruments for the *School* and *Teacher Questionnaire* (in English and Afrikaans) and 22 instruments for the *Parent* and *Learner Questionnaires* (in every official language). Figure 3.3 illustrates the translation and layout processes.

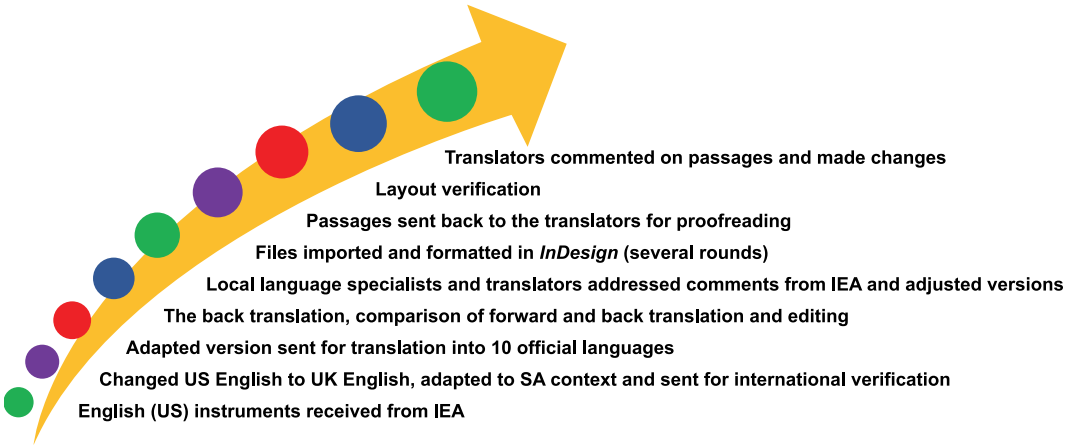


Figure 3.3: Translation and Formatting Processes for PIRLS Literacy 2016

After the creation of the booklets and questionnaires, quality assurance was conducted by the internal team, prior to being returned to Boston College in the USA for layout verification. The layout verification process required three working days and when instruments were received from Boston, further changes had to be made. The final print version was checked and signed off by the National Research Co-ordinator (NRC). This process took place in September and October 2015 and short timelines resulted in some of the layout verification only being completed after fieldwork had commenced.

3.4.6 Contacting Schools, obtaining Class Lists and confirming Participation

The process of contacting the schools consisted of making the initial contact with the schools, sending of letters, confirming participation, confirming school details and obtaining class lists. After recruiting and training callers, each was assigned specific province/s to call. Callers were provided with calling files, which contained the training manual, the interview protocol as well as the calling sheets for each sampled school of a particular province. The calling sheets contained the school information that needed to be confirmed, including the school name, principal's name, district, study (PIRLS/PIRLS Literacy), EMIS Number, school address, number of Grade 4 and/

or Grade 5 classes, stratum, contact person, telephone number, fax number and email address. All of the above data was recorded on the calling sheet. The callers requested the schools to send, by fax or email, the class lists of all the classes of the sampled grade with specific demographic information such as learner names and surname, class name, gender and date of birth. The follow-up phoning was implemented a week or so later to obtain the class lists. In the case of unreachable schools, the provincial co-ordinators and district officials were contacted to assist with updated contact details of the schools. After all possible avenues of contacting these unreachable schools were exhausted, replacement schools were contacted.

3.4.7 Field Trial

A field trial of the English version of the assessment instruments was conducted for both PIRLS and PIRLS Literacy nine months prior to the main study data collection. The field trial took place from 9–19 March 2015. The schools were contacted in the weeks prior to data collection by the Centre for Evaluation and Assessment (CEA). Of the 16 schools originally sampled, two declined to participate and were replaced. The field trial was only conducted in Gauteng and only in schools where the LoLT was English from Grade 1.

3.4.8 Data Collection Main Study

The data collection for the main study of PIRLS Literacy was conducted at the end of 2015 with a smaller percentage of schools (24%) at the beginning of 2016. An external company was contracted to implement the data collection. There was no statistically significant difference between the 2015 and 2016 performance in the PIRLS Literacy Grade 4 Study. Reading literacy is measured with the use of informational and literary texts, which in the PIRLS Literacy instruments is accompanied by approximately 13-15 items for each text. The four questionnaires, the *Learning to Read Survey* (parent/home), *School* (principal), *Teacher* (classroom) and *Learner* (student) contain items which shed light on the factors associated with reading comprehension. The international conceptual framework underpins the conceptual and methodological basis for the PIRLS Literacy 2016 study.

3.4.8.1 Packaging the materials

Packing assistants were recruited and trained to pack the boxes as per IEA guidelines. Boxes were prepared, labelled for each school, and colours assigned to each province. Each class had two boxes: Box 1 (a bigger box) contained achievement booklets, *Learner Questionnaires*, learner and teacher tracking forms, test administration forms, student response rate forms, school infrastructure checklist, pencils and sharpeners and Box 2 (a smaller box), contained the *School, Teacher* and *Parent Questionnaires*. The packer, assigned to pack a box for a particular class, received a package for that class from the dispatcher, consisting of stickers for achievement booklets and all the questionnaires, and student and teacher tracking forms. Achievement booklets were assembled in batches chronologically per language. A CEA quality control officer checked each box using a quality assurance checklist. The process was repeated for Box 2, where learner labels were pasted on the *Parent Questionnaires*. A quality control officer checked the box and despatched them for collection by the fieldwork company.

3.4.8.2 Procedures

Learners answered two passages on their own, and were given 40 minutes for each passage and its questions, with a break in-between. After the achievement booklets had been completed and collected, learners were given another break. Following the second break, the fieldwork administered the *Learner Questionnaire* by reading each question aloud and demonstrating how to answer the questions. The questionnaire administration was treated as an exam situation where learners were allowed to ask questions but not to speak to one another to reduce social desirability responding.

3.4.8.3 Challenges during data collection

Fieldwork for the IEA studies is always challenging given the complex nature of the design and the South Africa environment and conditions in schools. PIRLS 2016 was more challenging than previous cycles for the following primary reasons:

- A shorter international timeframe and subsequent late receipt of international instruments meant less time to translate instruments into 10 languages which was exceptionally challenging.
- The timing of the testing coinciding with the examinations in many schools was unfortunate and subsequently, had a negative impact on willingness of schools to participate and increased difficulties in securing dates.
- The forced closure of the University of Pretoria intermittently across the end of October and November 2015 due to student protest action cost the project a week of work, immediately before the fieldwork commenced, and had a significant impact resulting in rescheduling of testing. The forced closure again in January 2016 resulted in delays and more rescheduling.
- Finding an external fieldwork company to conduct the data collection is challenging as there are limited choices in South Africa. PIRLS study required a fieldwork company experienced in educational data collection with fieldworkers who have knowledge and experience of the South African school system. Furthermore, due to the many languages assessed, there is also a requirement that fieldworkers be fluent in the language of testing. Securing a fieldwork company meeting all requirements was very challenging when also taking into consideration the regulatory requirements as specified by the University of Pretoria.
- Annual National Assessments (ANAs) unexpectedly enforced on schools in December 2015 simultaneous to PIRLS fieldwork resulted in cancellations and refusals by schools. This ultimately shut down the fieldwork at the end of November 2015 with no further testing taking place in 2015, and as such, some testing was only completed in 2016.

As a result, the fieldwork of PIRLS and PIRLS Literacy was an immense challenge. However, the CEA worked closely with the selected fieldwork company to ensure high quality implementation of the project as well as timely completion.

3.4.9 Scoring

Whilst many of the items were multiple choice, there was a significant proportion of the items that were open-ended and required scoring. Strict standardised procedures were put in place for the scoring and quality assurance processes that were followed and are described below. Batches were created for each language in preparation for the scoring of the constructed response items in the achievement booklets. The scoring comprised several processes:

1. ***Recruiting Scorers:*** Scorers were recruited on the basis of the language of assessment and were required to have relevant educational training or experience.
2. ***Interviewing and Assigning Scorers to Teams:*** After scorers had been selected, they were assigned to either Team A or Team B. These teams were constructed for reliability scoring. Randomly selected achievement booklets were scored on separate sheets by both teams and these results were captured so that the reliability of the scoring could be compared.
3. ***Training of Scorers:*** A team of three researchers with expertise in Afrikaans, English and some of the African languages received international training on the scoring guides prepared by the IEA. During training, the recruited scorers first worked through the international training material which required them to score and discuss as a group approximately 15 practice examples for every item across all the assessments. This process familiarised them with the passages and the mark allocation for each item as laid out in the scoring guide. As batches of booklets became available for scoring, training became specific to the passages and assessments needing to be scored. Live booklets were then scored and moderated by those with the international training, with feedback, where necessary, given to the scorers.
4. ***Quality Assurance of Scoring:*** As Team Leaders emerged during the scoring process, these selected scorers received additional training which enabled expertise to develop in the moderation process across all the African languages. The Team Leaders for each representative language were then responsible for the quality assurance of the scripts for their team of scorers.
5. ***Cross-Country Reliability Scoring:*** This was done at the end of the study when South African scorers scored the same materials as scored internationally using the IEA Cross-Country Scoring and Reliability Software. The selected materials were only drawn from English-speaking countries. The cross-country reliability scoring involved all the scorers who scored English Language items. These scorers were assigned items from other countries to score so that their scoring could be compared to the international scoring level.
6. ***Trend Reliability Scoring:*** The trend reliability study was done with the IEA materials from PIRLS 2011 trend passages, which were scanned in and provided electronically to the trend countries. Trend scoring was used to ensure consistent scoring over time. Scorers made use of the IEA Trend Scoring and Reliability Software. The trend reliability scoring study meant that scorers had the additional work of scoring 2011 items on a laptop. These items were scanned from the South African 2011 achievement results and scorers scored them so that their current scoring for 2016 could be compared to the scoring done in 2011.

Throughout the scoring process, rigorous quality control was in place. This resulted in 25% of instruments being randomly checked by quality controllers to ensure high levels of scoring reliability. Figure 3.4 shows a visual representation of the scoring processes.

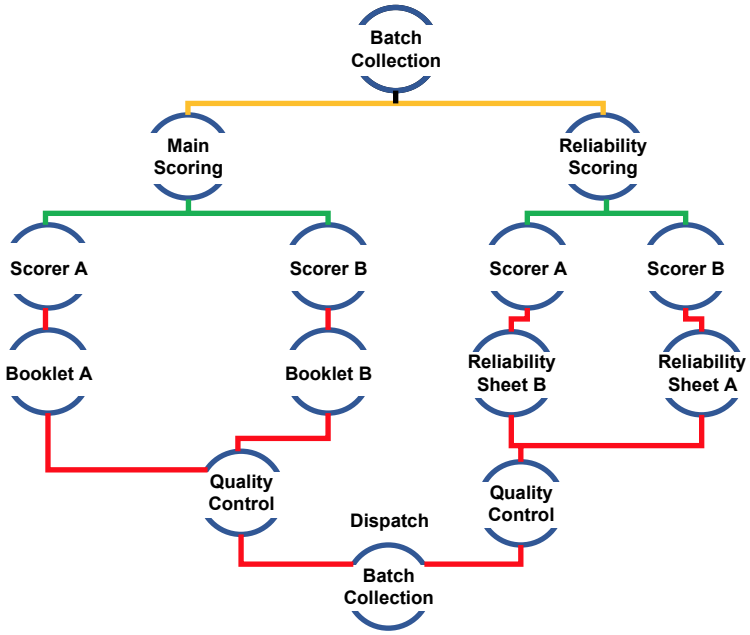


Figure 3.4: Scoring Processes followed for PIRLS Literacy Scoring

Scorers completed reliability sheets: each scorer was assigned to either Team A or Team B and scored only these booklets, but then scored a percentage of the other team's booklets on a separate sheet. The scoring process provided evidence of the scoring reliability. Quality assurance workshops were held to improve coherent understanding of the scoring process. Overall, the scoring process was of a high quality with the scoring team working hard to complete the process (reliability above .90 for scoring).

3.4.10 Data Capturing and Processing

The IEA's program, Data Management Expert (DME), was used to capture the data. The CEA, with help from the IEA data centre, created templates for the capturing of all instruments and associated forms. An external capturing company was selected to capture all data from the instruments, including the achievement booklets, the questionnaires and other related forms. A team of approximately 40 data capturers was trained by the CEA Data Manager but data capturing was done at the company's premises. Throughout the capturing process, the Data Manager was involved in an extensive data cleaning process, sending feedback to the capturing company with requests to correct errors. Data cleaning included identifying and correcting corrupt or inaccurate records from the databases and involved identifying incomplete, incorrect, inaccurate or irrelevant parts of the data and then correcting, modifying, or deleting them. Data verification was done for 100% of all instruments (double capturing), resulting in every instrument being captured by two people and then compared to minimise capturing errors. The DME has built-in checks and data validation techniques which assist

the Data Manager in ensuring that the data capturing is of a good standard. The use of this software also allowed the Data Manager to track the progress of each scorer and determine the number of errors per scorer. This information is necessary in order to determine each capturer's reliability. Each individual query is sent back to the capturing company where errors are corrected. The double capturing confirmed that the data were being captured correctly and ultimately, a clean database was submitted to the IEA.

In this report, many contextual factors are included and they are derived from the questionnaires. Contextual factors are variables other than the achievement scores. When considering the contextual factors, it is important to take into consideration the percentage of missing data. Data are missing at two levels, firstly if the questionnaire was not returned, secondly if the questionnaire was returned but the respondent elected to not answer certain questions. Table 3.5 presents the percentage of questionnaires returned per type of questionnaires, the first type of missing data.

Table 3.5: Return Rate of Questionnaires per language group for PIRLS Literacy Grade 4 Study

Language	% Learner Questionnaires Returned	% Parent Questionnaires Returned	% Teacher Questionnaires Returned	% School Questionnaires Returned
Afrikaans	100%	68%	84%	92%
English	99%	67%	84%	77%
isiNdebele	100%	93%	100%	100%
isiXhosa	100%	72%	94%	87%
isiZulu	99%	55%	83%	76%
Sepedi	100%	90%	90%	95%
Sesotho	100%	74%	89%	96%
Setswana	100%	76%	90%	83%
siSwati	100%	80%	100%	100%
Tshivenda	100%	98%	100%	95%
Xitsonga	100%	78%	95%	95%
South Africa	**100%**	**74%**	**90%**	**87%**

The return rate of *Parent Questionnaires*, answered by parents or guardians is especially challenging in a large-scale assessment study such as PIRLS. The parents of learners in isiZulu schools had the lowest return rate of questionnaires (only 55%). This was followed by English (67%) and Afrikaans (68%). Overall the return rates of the questionnaires were high for South Africa, with the exception of the *Parent Questionnaire*. Table 3.6 illustrates the return rate for questionnaires per province.

In KwaZulu Natal, the parents or guardians of learners returned only 44% of the questionnaires, while in the Western Cape (60%) and Gauteng (63%) the return rates were also low. KwaZulu Natal also had a lower return rate for the *Teacher* and *School Questionnaires* when compared to other provinces. This should be kept in mind when interpreting the contextual factors.

Table 3.6: Return Rate of Questionnaires per province for PIRLS Literacy Grade 4 Study

Province	% Learner Questionnaires Returned	% Parent Questionnaires Returned	% Teacher Questionnaires Returned	% School Questionnaires Returned
Eastern Cape	100%	71%	88%	87%
Free State	98%	77%	80%	91%
Gauteng	99%	62%	83%	77%
KwaZulu Natal	100%	44%	79%	71%
Limpopo	100%	95%	98%	98%
Mpumalanga	100%	80%	100%	100%
North West	100%	79%	92%	88%
Northern Cape	100%	81%	87%	86%
Western Cape	100%	60%	89%	79%
South Africa	**100%**	**74%**	**90%**	**87%**

3.4.11 Quality Assurance in the PIRLS Literacy Study

Quality assurance took place at every step of the PIRLS Literacy implementation process. Sampling was done by Statistics Canada with a database of schools and classes taken from the EMIS database. Contacting schools took place in close collaboration with the provincial educational departments and included verifying the information obtained from the EMIS database. Class lists were captured using the IEA program and data cleaning conducted by the CEA team. Fieldwork was monitored by both the CEA and the international monitor. Data capturing was monitored by the CEA and checked by the Data Processing Centre (DPC). The quality of scoring was assured by reliability scoring and monitored extensively by the CEA team. CEA members and external companies involved in the processes underwent intensive training in data collection, scoring, capturing and analysis. The IEA also has built-in quality assurance processes such as translation verification, layout verification, international quality monitors, reliability scoring, cross-country scoring, trend scoring, double-capturing system (100% verification) and data analysts who check quality of the data.

3.4.12 PIRLS Literacy Data and Analysis

The Data Processing Centre (DPC) in Hamburg conducts the final data processing and provides the final datasets to all countries as well as software and support for analysis.

International Database Analyzer: The International Study Centre and country participants in PIRLS and other international studies use the International Database (IDB) Analyzer software to analyse their data for country reports amongst others. This was created for IEA data as it takes into account the IEA's different studies' complex procedures for sampling, weights and multiple imputed achievement scores to generate statistical results (Foy & Drucker, 2013). It may be used in conjunction with SPSS or SAS to analyse the data. IDB Analyzer can be used to merge files and compute a range of statistics, including percentages of learners in subgroups and mean learner achievement in the subgroups. It can also run more complex statistics such as correlations, regressions coefficients and percentiles of achievement distribution as well as

cumulative or discrete benchmarks.

Using Plausible Values for Proficiency Estimation: In order to produce the scores for the achievement results as presented in this report, PIRLS makes use of plausible values (PVs). In each cycle, PIRLS depends on Item Response Theory (IRT) scaling to combine each participating country's learner population and to provide accurate estimates of learner reading achievement. PIRLS Literacy scaling methodology also makes use of multiple imputation or more generally known as plausible values to obtain learner reading proficiency scores. Learners only answer questions for two passages but their scores are estimated for all passages through the use of IRT scaling (Martin & Mullis, 2012). Plausible values use all available background data to estimate the characteristics of learner populations by using multiple imputations from estimated ability distributions and can be analysed with statistical software for reporting. For more detail on plausible values see Martin et al., 2017.

3.5 Comparisons between the International Study and the South African Implementation

Table 3.7: Summary of Roles and Processes followed for PIRLS Literacy in South Africa and the International Management and other Countries

Activity	PIRLS Literacy International	PIRLS Literacy South Africa
Instrument design (passages)	• Expert group designed the passages and items.	• SA used the internationally designed instruments. • SA attended meetings to give inputs into which passages and items to be used. • SA also submitted passages for consideration.
Instrument translation	• Internationally US English version was designed. • Countries contextualised (including cultural adaption) and translated. • IEA conducted translation verification.	• SA followed the IEA guidelines of translating and back-translating. • SA has more extensive translation due to implementing in 11 languages. • Translation verification done by the IEA. Questionnaires the same as the international versions but with added national options.
Instrument layout	• Standardised layouts which all countries followed. • Layout verification conducted by IEA,	• SA followed the international guidelines for layout.
Instrument printing and packing	• Internationally instruments were printed in colour. • Standardised procedures for packing.	• SA did not print in colour. • SA followed IEA standardised packing procedures.
Data collection	• Internationally some countries used teachers as "school co-ordinators" to collect data. • Whilst others used external data collectors.	• SA contracted an external company to conduct fieldwork.
Scoring	• Standardised scoring manuals and training provided in English by IEA.	• Scoring was done according to IEA training and procedures. • SA did not translate the scoring guides prior to scoring, scorers translated during training.
Capturing	• The DME Program designed and training on program provided by IEA.	• SA used DME which was provided by the IEA but increased verification to 100%.
Analysis for national report	• DPC worked with countries to clean data. • Processing conducted by DPC.	• SA used IDB analyzer as recommended by IEA. • SA created additional variables relevant to country (for example, quintiles).
Reporting	• IEA provided international report	• SA designed country report based on data received from IEA DPC and local context.

In Table 3.7 the differences between how PIRLS was implemented internationally compared to locally is shown.

3.6 Conclusion

PIRLS Literacy is a large, complex project which involved many stages of planning and implementation. The main goal was to gain insights into how well learners in Grade 4 read in their language of instruction. PIRLS Literacy, as with the previous cycles, remains the only international comparative large-scale assessment study in South Africa (and internationally) that assesses reading literacy in all 11 languages and offers benchmark findings against international standards, providing critical information for policy and practice. This chapter endeavoured to give a brief explanation of the design, methods and processes involved in the PIRLS Literacy study. Readers are encouraged to read IEA materials such as the Assessment framework document (see Mullis & Martin, 2013) to gain deeper understanding into the complexities of conducting large scale international assessment programmes and to provide

CHAPTER 4: SOUTH AFRICAN LEARNER ACHIEVEMENT IN READING LITERACY IN 2016

Sarah Howie and Mishack Tshele

4.1 Introduction

PIRLS 2016 is designed as an international comparative assessment study for reading literacy and as such the South African results can be compared to those of other countries that participated in PIRLS 2016. However, as explained in Chapter 1 and 3, a nationally representative sample of Grade 4 learners attending schools that represented all 11 official languages, participated in PIRLS Literacy (a less difficult assessment). A sample of Grade 5 learners who attended schools in only three official languages (Afrikaans, English and isiZulu) participated in PIRLS 2016 (more difficult assessments) and therefore, the Grade 5 sample was only considered a benchmark participant as it did not reflect the national population of all Grade 5 learners.

As explained earlier, the results in this chapter pertain only to the PIRLS Literacy component of PIRLS 2016 written by the South African Grade 4 learners. Whilst all countries that participated in PIRLS Literacy wrote the same tests, the South African Grade 4 PIRLS Literacy results have been rescaled and can also be compared in three languages in which the Grade 5 learners wrote (Afrikaans, English and isiZulu) as well as the international Grade 4 learners who wrote the PIRLS tests (see Chapter 3 for details).

In this chapter, the performance of the South African Grade 4 learners is compared to the performance in reading literacy of other participating countries in PIRLS Literacy. This chapter explores the learner achievement scores in terms of the variables province, gender, test language, and home language as well as the reading purposes.

4.2 International Achievement in PIRLS Literacy

Figure 4.1 presents the distributions of achievement results of the countries that participated in the PIRLS Literacy component of PIRLS 2016. Six countries participated in PIRLS Literacy namely: South Africa, Morocco, Egypt, Kuwait, Iran and Denmark. An average of 500 points with a standard deviation of 100 points was obtained through the use of Item Response Theory (IRT) scaling and participant achievement is depicted relative to this international mean.

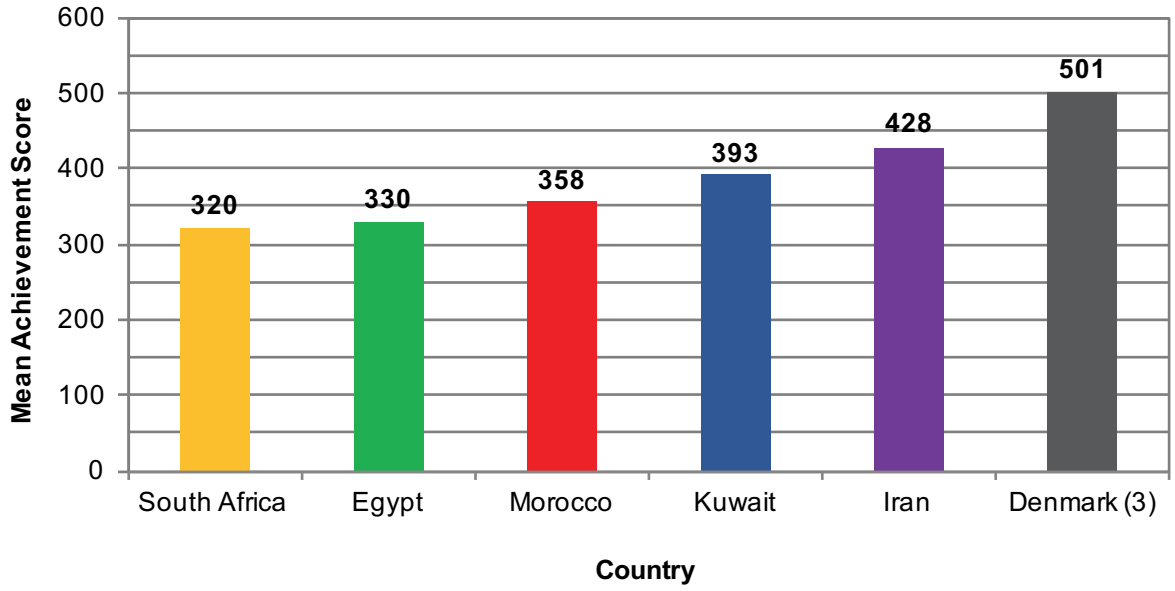


Figure 4.1: South African Grade 4 Learner Achievement compared to other Countries participating in PIRLS Literacy 2016

Of the six countries participating in PIRLS Literacy 2016, South African Grade 4 learners achieved the lowest scores (320, SE=4.4) and Denmark Grade 3 learners (501, SE=2.7) achieved the highest scores. The Danish Grade 3 children were 10 months younger (9.8 years) than the South African Grade 4 learners who were 10.6 years on average when tested. Whilst Denmark tested their Grade 3 learners with the PIRLS Literacy 2016 assessments, they included Grade 4 learners in PIRLS 2016, whilst South Africa tested their Grade 5 learners in PIRLS 2016. The South African learners were amongst the older learners taking part in PIRLS and the oldest participating in PIRLS Literacy.

There was an approximately 180-point difference between these two countries despite Denmark's Grade 3 learners being compared with South African and other countries' Grade 4 learners. However, South Africa's score (320, SE=4.4) was not significantly lower than that of Egypt (330, SE=5.6). The three African countries performed within 40 points of each other with five of the six countries performing below the International centre point of 500. Grade 3 learners from Denmark were the only learners to achieve above 500.

South Africa's average achievement in reading literacy as well as countries participating in PIRLS Literacy at the Grade 4 level is depicted in Figure 4.2 relative to that of certain reference countries, including those in the top five positions (Russian Federation, Singapore, Hong Kong, Ireland and Finland). As described in Chapter 3, the scores from PIRLS Literacy 2016 were put onto the same scale as the scores from PIRLS 2016 and therefore South Africa's Grade 4 performance can be compared to all of participants from PIRLS with national representative samples.

Figure 4.2: International Achievement of selected Countries in PIRLS and PIRLS Literacy 2016

In Figure 4.2, the results of the top 5 performing countries from PIRLS (Russian Federation, Singapore Hong Kong, Ireland and Finland), the participants in PIRLS Literacy (South Africa, Egypt, Morocco, Kuwait, Iran and Denmark Grade 3) as well as other countries of interest such as Canada (which tested in English and French), Chile (an emerging economy) and New Zealand (bilingual system tested in English and Maori) are depicted on the same achievement scale (see Chapter 3). A few of the participating countries had post-colonial characteristics in the languages of testing (see Howie & Chamberlain, 2017).

The top performing countries for PIRLS achieved substantially higher scores than PIRLS literacy countries except for Denmark (Grade 3) which is comparable. This confirms the decisions of the PIRLS Literacy countries to participate in the less demanding assessment, PIRLS Literacy. The Russian Federation, the highest performing country, achieved approximately 250 points more than South Africa. All three African countries were the lowest three performing countries in PIRLS 2016. Egypt and Morocco tested in Arabic, the academic version of the language which differs from the local dialect spoken in many homes in these countries.

South Africa's Grade 4 learner achievement on the overall PIRLS scale was very low, achieving the lowest score of the 50 education systems participating (see Appendix B) although not significantly below Egypt. Sixteen systems fell below the international centre point, including South Africa. The top five performing countries, the Russian Federation, Singapore, Hong Kong, Ireland and Finland represent diverse regions of the world. Of the top five countries, only Singapore and Hong Kong wrote the test in more than one language. Seventy points represents the difference between all the countries above the international centre point. However, there is a 180-point difference between the countries/systems below the international centre point. There was a 40-point difference amongst the top 25 education systems and 34 countries achieved above the international centre point. Almost all countries tested Grade 4 learners except Norway that tested Grade 5 learners. The youngest learners were tested in Kuwait, (average age 9.6 years) who despite being a year younger than the South Africa learners,

achieved 393 points (SE=4.1) and 70 points more. Learners from the Eastern and Northern European countries in PIRLS in general were older with learners from Latvia at 10.9 years being the oldest and the others at 10.8 years included learners from Bulgaria, Denmark (Gr 4), Lithuania, Poland and the Russian Federation.

4.3 Provincial Achievement in PIRLS Literacy

As in PIRLS 2006, the South African sample was stratified by province allowing for explicit comparisons between provinces as this was of direct interest to the Heads of Provinces voiced at a national meeting of Ministers after PIRLS 2011.

None of the provinces achieved a mean score above the international centre point (see Figure 4.3). The highest achieving province was Western Cape with the lowest provincial mean score being found in Limpopo. A difference of almost 100 points was found between the two provinces. Both the Eastern Cape and Limpopo achieved mean scores below 300 points.

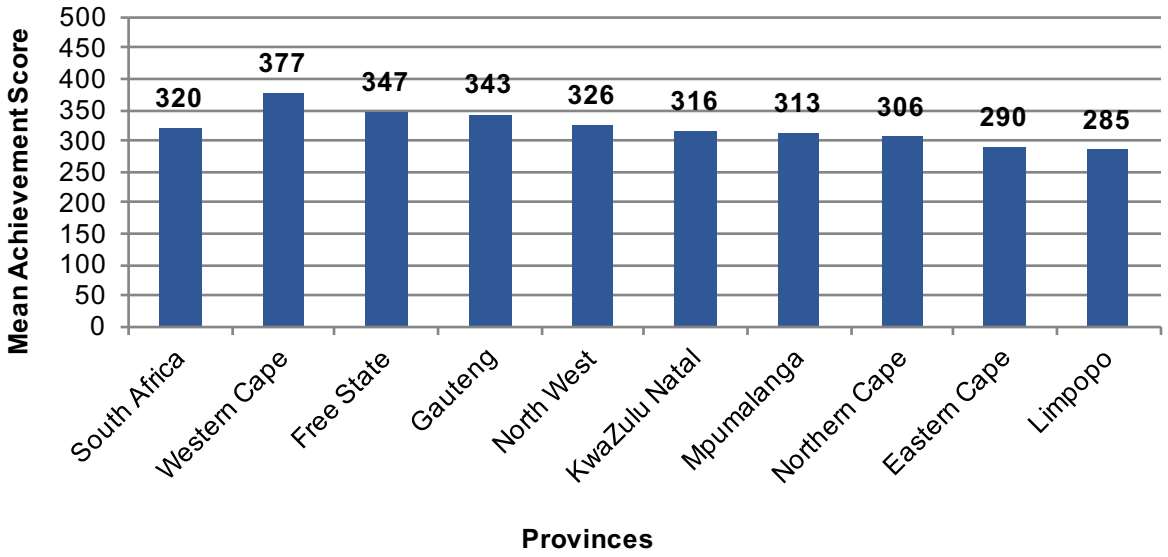


Figure 4.3: South African Grade 4 Learner Achievement in PIRLS Literacy 2016 by Province

The greatest variance in the mean score can be seen in Gauteng (see Figure 4.4), indicating that learner performances varied very widely within that province (both high and low). This variance may be due to the language sampling in the province which was very complex compared to other provinces. In both Gauteng and Mpumalanga provinces, seven languages were tested. In terms of both provinces, these languages included the best performing (Afrikaans and English) and the lowest performing (Sepedi), resulting in a wide variation in the achievement of learners. However, larger samples of Afrikaans and English learners were tested in Gauteng compared to Mpumalanga.

Limpopo had the smallest variation in its mean score and learners tended to score within a narrower margin of achievement. This is possibly due to the fact that there was great similarity in the performance of learners in the languages tested in Limpopo who exhibited uniformly low

achievement. Both the Western Cape and Gauteng revealed individual achievements above 500 points at the 95th percentile, whilst the Eastern Cape exhibited very low achievements at the 5th percentile stretching to almost 100 points. At this point, the measurement would be most unstable and this achievement is of great concern. Other provinces with low scores at the 5th percentile (well below 200 points) are the Northern Cape and Limpopo. The distribution of the South African and provincial achievement scores are presented in Figure 4.4.

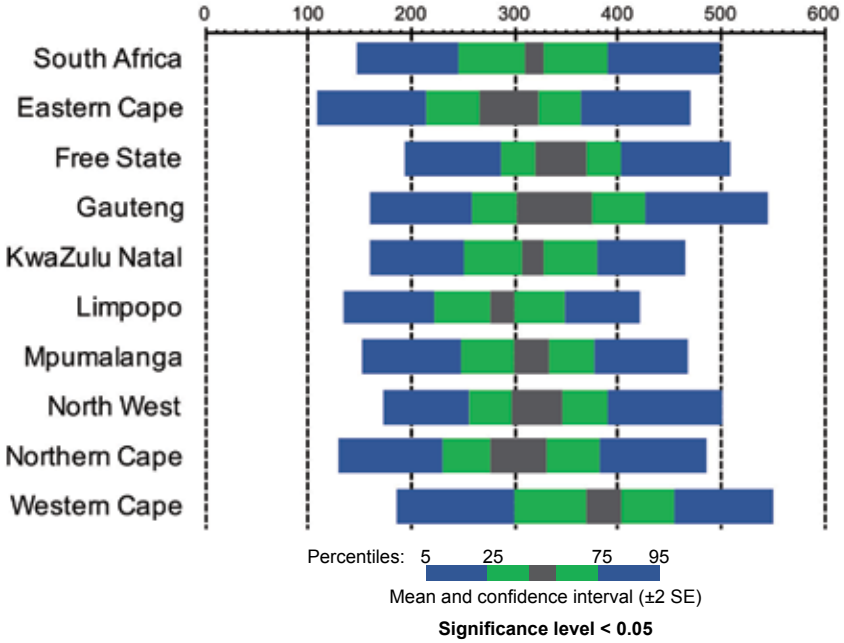


Figure 4.4: Distribution of Grade 4 Learner Achievement in PIRLS Literacy 2016 for all Provinces

How to interpret the percentile graph

- ***Scale of graph:*** *The graph is set on a scale of 0 to 1000. The results are shown in terms of percentiles[13] based on the plausible values (PV). PIRLS plausible values are imputed scores based on raw item scores and modelled with demographic factors and anchored to values from previous rounds of the study.*
- ***Bands:*** *The gray band is the mean of the group plus or minus two Standard Errors (SE) on either side (M + 2 SE and M – 2 SE). The green band on the left is the 25th percentile to the mean minus two SE, and on the right the mean plus two SE to the 75th percentile. The blue band on the left indicates the 5th percentile to the 25th percentile, and on the right the 75th percentile to the 95th percentile.*
- ***Length of the Band:*** *indicates the spread of the scores (not the number of learners). Less spread means that the group is more homogeneous (narrower blocks), and groups with greater heterogeneity are indicated by wider blocks.*
- ***Standard Error:*** *A large standard error shows that the data is widely spread (less reliable) and a small standard error shows that the data are clustered closely around the mean (more reliable). The standard error is a statistical term that measures the accuracy with which a sample represents a population. In PIRLS, large standard errors are greater than 10 (rule of thumb). Greater than 20 should be noted as it may indicate too much variance around the mean.*

[13] Percentile: A percentile is a score at or below which a certain percentage of the distribution lies.

A statistical analysis was undertaken to ascertain the differences in achievement between the nine provinces (see Table 4.1). Only the Western Cape learner achievement is significantly higher (377, SE=8.8) in achievement than any other province, with the exception of Gauteng (343, SE=17.6). Free State achieved the second highest score at 347 points, (SE=12.6) and achieved statistically higher results than five other provinces. Although Gauteng had the third highest score, due to the large standard error (indicating a wider variation in the mean score) for Gauteng, there was no statistically significant difference between Gauteng and most provinces other than the Eastern Cape and Limpopo. Gauteng tested in seven languages Afrikaans, English (the two highest performing languages), isiZulu, Sepedi, Sesotho, Setswana and Xitsonga. The lowest performing province, Limpopo, achieved a lower mean score than all other provinces, except for the Northern Cape and the Eastern Cape.

Table 4.1: Significant Provincial Differences for South African Grade 4 Learners participating in PIRLS Literacy 2016

Province	Mean	SE	Western Cape	Free State	Gauteng	North West	KwaZulu Natal	Mpumalanga	Northern Cape	Eastern Cape	Limpopo
Western Cape	377	8.8		▲	●	▲	▲	▲	▲	▲	▲
Free State	347	12.6	▼		●	●	▲	▲	▲	▲	▲
Gauteng	343	17.6	●	●		●	●	●	●	▲	▲
North West	326	12.9	▼	●	●		●	●	●	●	▲
KwaZulu Natal	316	5.4	▼	▼	●	●		●	●	●	▲
Mpumalanga	313	9.0	▼	▼	●	●	●		●	●	▲
Northern Cape	306	13.9	▼	▼	●	●	●	●		●	●
Eastern Cape	290	14.1	▼	▼	▼	●	●	●	●		●
Limpopo	285	5.4	▼	▼	▼	▼	▼	▼	●	●	

▲ Significantly higher than ▼ Significantly lower than ● Not significantly different
Significance level < 0.05

4.4 National and Provincial Achievement in PIRLS Literacy by Gender

Boys comprised more than half of the sample (52%) (see Figure 4.5). However, their achievement was significantly below that of the girls as boys scored 295 points (SE=5.1) compared to 347 points (SE=4.0[14]). South Africa has the second largest achievement gap (52 points) between boys and girls other than Saudi Arabia (where girls scored more by 65 points).

[14] t value = -17,94

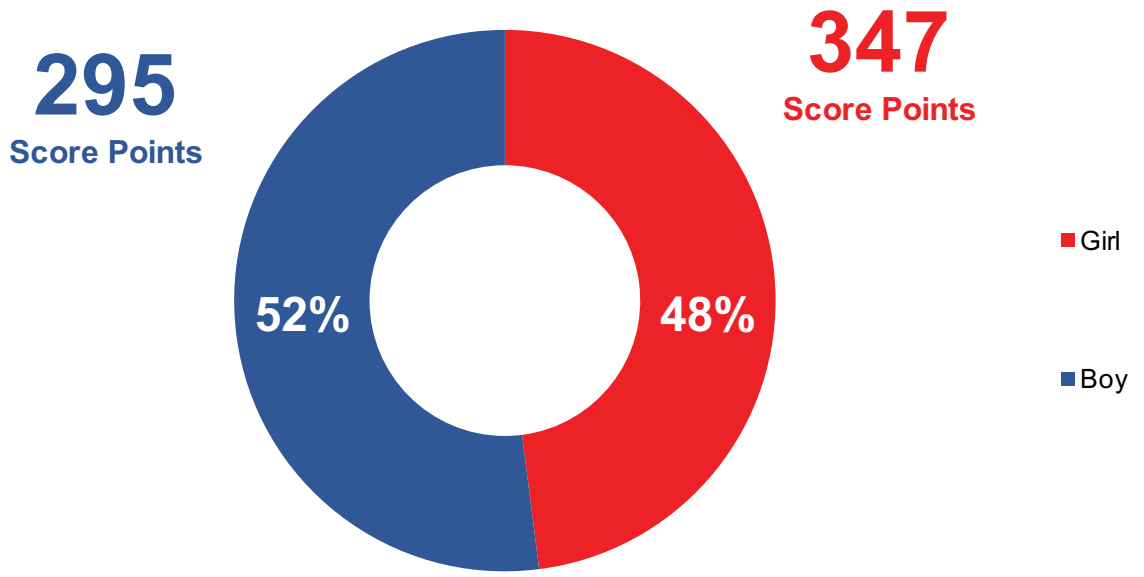


Figure 4.5: South African Grade 4 Learners participating in PIRLS Literacy 2016 and their Mean Achievement by Gender

The pattern was similar across all languages as girls consistently performed better than the boys (see Figure 4.6). As indicated earlier, there was a higher percentage of boys than girls nationally; however, this was particularly pronounced in Afrikaans where almost 56% of the learners were male and the gap was 40 points favouring girls. The largest differences in the scores were found for Xitsonga (63 points), followed by Sepedi (55 points), both favouring girls. These are substantial differences as they indicate more than one year's difference in education terms.

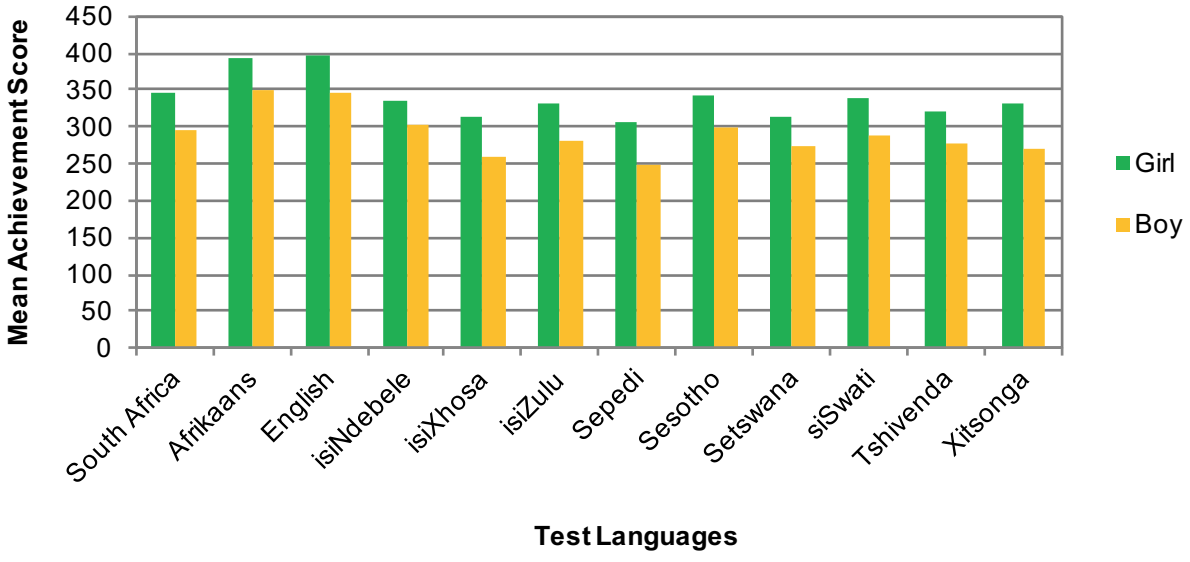


Figure 4.6: South African Grade 4 Learner Achievement in PIRLS Literacy 2016 by Gender

4.5 South African Achievement in PIRLS Literacy for 11 Test Languages

As described in Chapter 3, a nationally representative sample was drawn by test language (LoLT in Grades 1-3) meaning that the performance of learners could be analysed and compared in each language. Figure 4.7 reveals the achievement of the learners by test language. All 11 official languages were assessed in PIRLS Literacy 2016, as had been the practice in PIRLS 2006 and prePIRLS 2011.

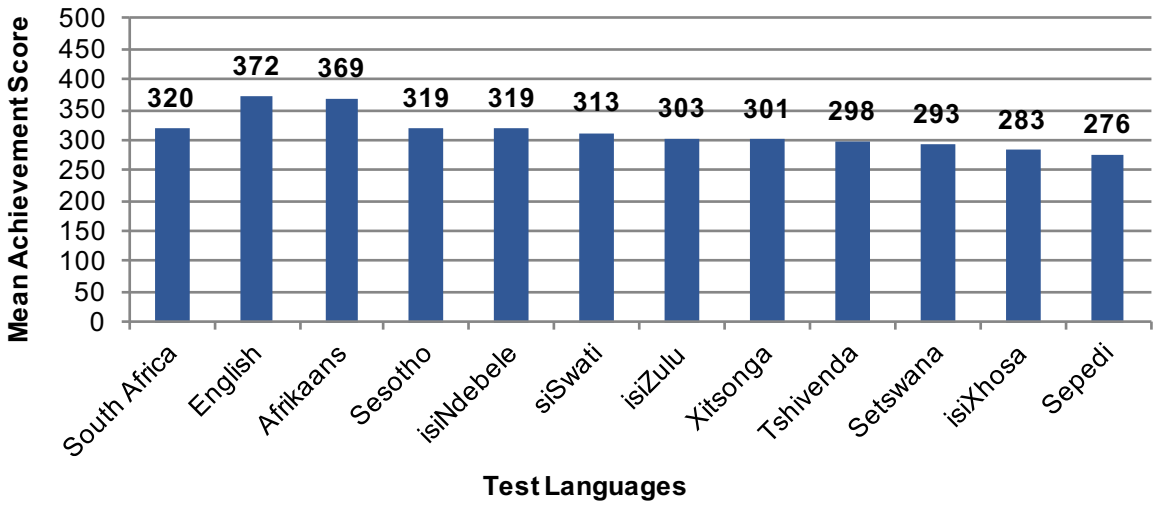


Figure 4.7: South African Grade 4 Achievement in PIRLS Literacy 2016 by Test Language

No tested language in South Africa reached the international centre point (see Figure 4.7). The highest performing test languages were English (372, SE=14.4) and Afrikaans (369, SE=13.4). The lowest performing language was Sepedi, similar to the finding made in PIRLS 2011 (see Chapter 6 on Trend results). The variation in achievement between the African languages was very limited (43 points) between the highest (Sesotho, 319, SE=6.2) and lowest (Sepedi, 276, SE=6.5) performing languages.

The differences between languages were tested statistically (see Table 4.2). The learners writing in English and Afrikaans achieved higher scores than the African languages but did not differ statistically (as indicated in Table 4.2). Sepedi attained the lowest scores significantly below eight other languages (as indicated by the downward pointing arrows), but not statistically below isiXhosa and Setswana (as indicated by the circles in Table 4.2).

Table 4.2: Multiple Comparisons by Language for all 11 Test Languages for South African Grade 4 Learner Achievement in PIRLS Literacy 2016

Languages	Mean	SE	English	Afrikaans	Sesotho	isiNdebele	siSwati	isiZulu	Xitsonga	Tshivenda	Setswana	isiXhosa	Sepedi
English	372	14.4		●	▲	▲	▲	▲	▲	▲	▲	▲	▲
Afrikaans	369	13.4	●		▲	▲	▲	▲	▲	▲	▲	▲	▲
Sesotho	319	6.2	▼	▼		●	●	▲	●	▲	▲	▲	▲
isiNdebele	319	10.2	▼	▼	●		●	●	●	●	▲	▲	▲
siSwati	313	7.3	▼	▼	●	●		●	●	●	▲	▲	▲
isiZulu	303	4.3	▼	▼	▼	●	●		●	●	●	●	▲
Xitsonga	301	9.2	▼	▼	●	●	●	●		●	●	●	▲
Tshivenda	298	7.8	▼	▼	▼	●	●	●	●		●	●	▲
Setswana	293	6.3	▼	▼	▼	▼	▼	●	●	●		●	●
isiXhosa	283	11.1	▼	▼	▼	▼	▼	●	●	●	●		●
Sepedi	276	6.5	▼	▼	▼	▼	▼	▼	▼	▼	●	●	

▲ Significantly higher than ▼ Significantly lower than ● Not significantly different
Significance level < 0.05

In Figure 4.8, the distributions of learner achievement for learners writing in the test languages, including the average scale score with its 95 percent confidence interval and the ranges in achievement for the middle half of the students (25th to 75th percentiles), as well as the extremes (5th and 95th percentiles), are represented.

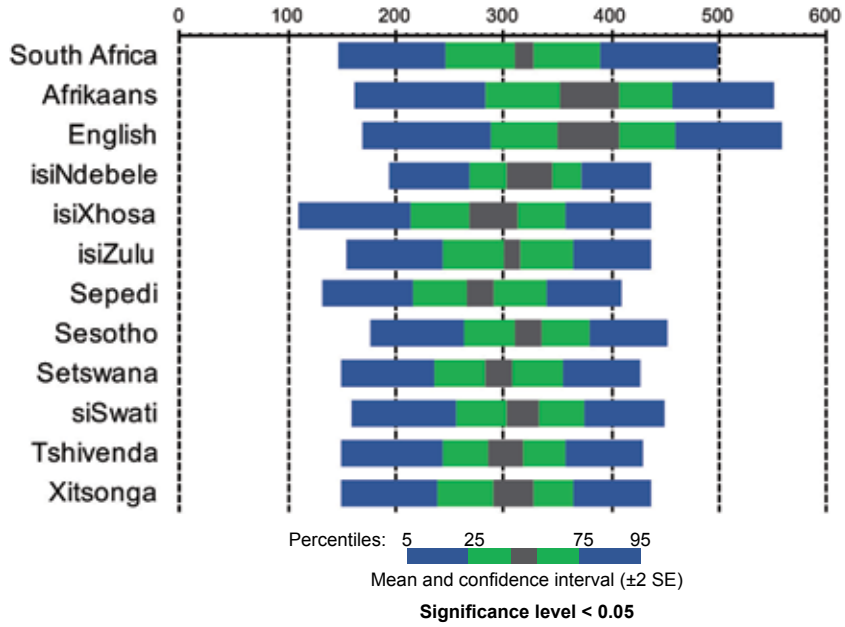


Figure 4.8: Comparison of South African Grade 4 Achievement in PIRLS Literacy 2016 for all 11 Languages

The greatest variation with the scores was found in Afrikaans and English, indicating a wider range of achievement than in the other languages (below 200 to above 500). The language with the least variation in the mean scores was isiZulu. The 95th percentile for Afrikaans and English was achieved at well over 500 points. All the other languages 95th percentiles were achieved at about 100 points less, at just over 400 points. Of concern was the 5th percentile attained at just above 100 points meaning that the weakest learners in that language (isiXhosa), were performing at an extremely low level.

4.6 South African Achievement in PIRLS Literacy by Test Language and Home Language

The South African home environment may be very complex in terms of the languages spoken in many homes where multilingualism or bilingualism is relatively common (see Chapter 9). A number of questions were included in the questionnaires to learners, parents, teachers and principals about the test language and the home language. In Figure 4.9, the findings of the test language being spoken at home were included. Learners were asked how often they spoke the language of the test at home, and answer options included *Always, Almost Always, Sometimes and Never*.

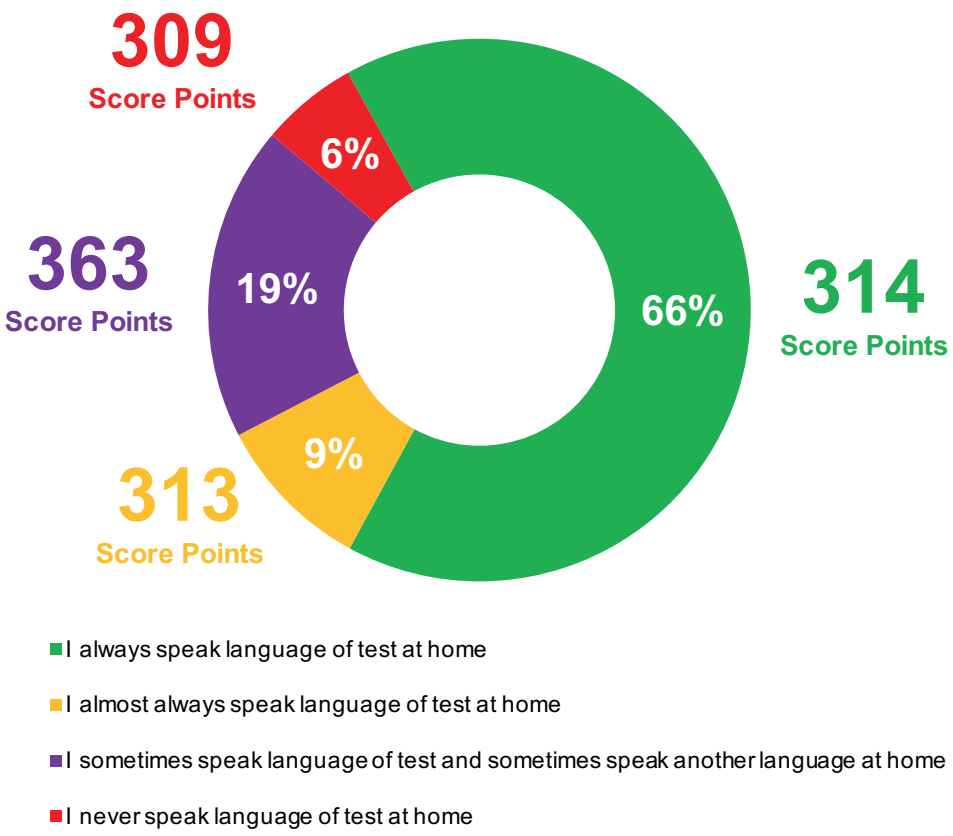


Figure 4.9: Frequency with which South African Grade 4 Learners in PIRLS Literacy 2016 speak the Test Language at Home and their Achievement

Figure 4.9 and 4.10 are based on two different variables and should not be directly compared. Figure 4.10 is based on the main language that the learners and their parents reported speaking at home.

Two-thirds (66%) of learners *always* spoke the language of the test at home and in total three quarters *always* or *almost always* spoke the language of test at home. The percentage of "first language" learners is greater than the international average (63%) and significantly above high achieving countries Singapore (30%) and Hong Kong (54%).

In order to understand the proportion of learners writing in their specific home language (see Chapter 2 for further information) and those having to write the test in an alternate language to their home language, a combined variable was created based upon data from the *Learner Questionnaire* and *Parent Questionnaire* data. In the original *Learner Questionnaire*, a question was included *What Language was Mostly Spoken at Home* for the learners, given the many multilingual homes. In the *Parent Questionnaire*, the parents were asked what language they spoke mostly at home. Given the importance of the information, an attempt was made to secure information for every learner, so where there was missing data in the *Learner Questionnaire*, it was supplemented by the *Parent Questionnaire* data, thereby reducing the missing data to 1.3%.

Twenty-nine percent of the learners wrote in a test language they do not speak at home (see Figure 4.10), and an analysis was done of learner achievement where they wrote in their first language and where learners wrote in their second language. Those learners who spoke the test language at home (71%) were regarded as home language speakers and labelled "same" and those who did not speak the test language at home (29%) were deemed second language speakers and labelled "different" in Figure 4.10.

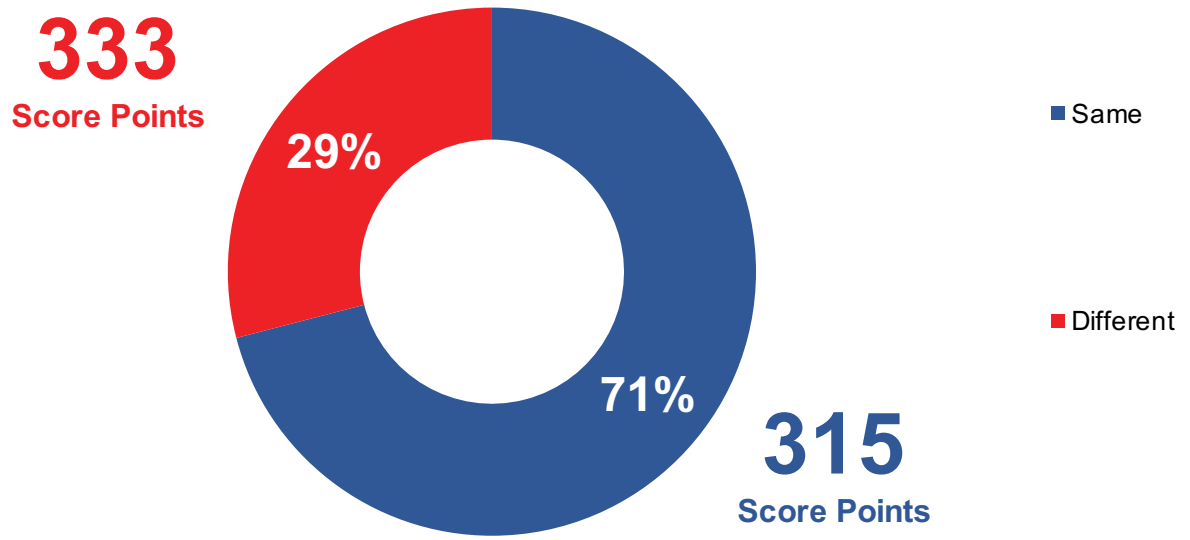


Figure 4.10: South African Grade 4 Learners in PIRLS Literacy 2016 who speak the same or a different language to the Test Language at Home and their Achievement

Learners writing in their first language (same) achieved significantly lower marks (315, SE=4.1) than those who wrote in their second language (different) (333, SE=7.5).[15] It is significant that six percent of learners reported never speaking the language they were tested in at home (see Figure 4.9).

An analysis was undertaken across the 11 languages to ascertain the extent of any differences in achievement of the learners who wrote in the test language as their first language or second language (see Figure 4.11).

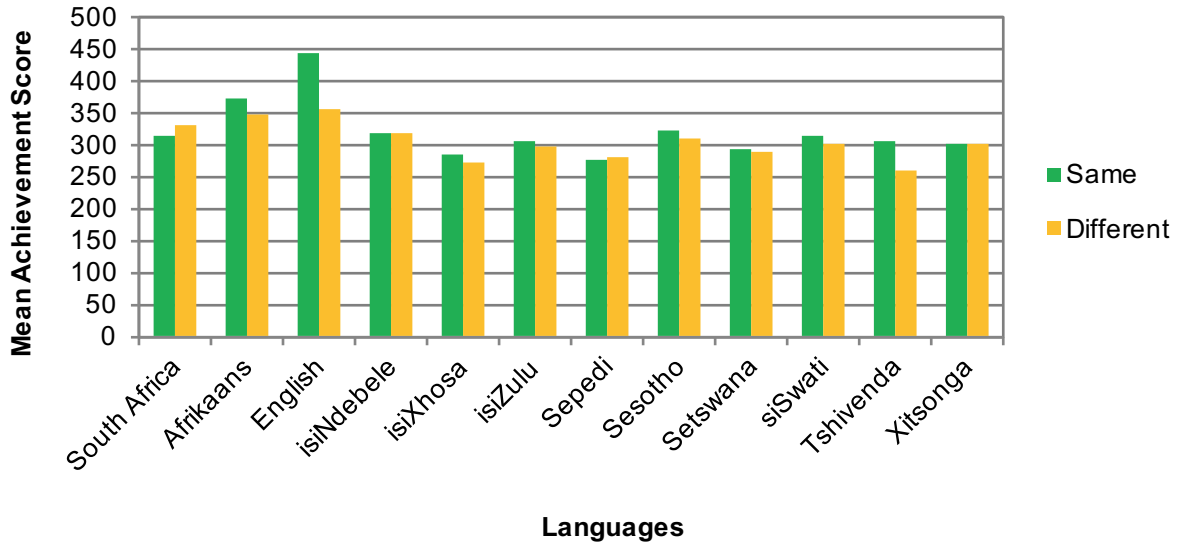


Figure 4.11: Achievement of South African Grade 4 Learners tested in PIRLS Literacy 2016 in the same as or different language to their Home Language

The profile of achievement varied across languages with learners writing in their first language (same), achieving slightly higher scores, although only in two languages were these significantly higher than those writing in a second language (different). In only isiXhosa were there less than 10% of the learners who wrote in a different language to their home language. The highest percentage of second language speakers was found in English where 79% of learners wrote in a different language to their home language. isiNdebele and Setswana (both 25%) had the highest percentages of learners writing in a different language to their home language. Learners who were second language speakers in Afrikaans and English achieved higher scores than first language speakers in all other languages.

Learners writing in English as their first language, achieved the highest mean score (445, SE=13.7). Those writing in Tshivenda but not mainly speaking Tshivenda at home achieved the lowest scores (259, SE=9.7). The only statistical differences found were those for English and Tshivenda where the learners, writing in their home language, achieved higher scores than those writing in a different language. There were no significant differences in achievement in other languages.

[15] t = -2.74

In Figure 4.12, the achievement of learners writing the PIRLS Literacy tests in their first language (same) and writing in a second language (different) is presented. The majority of learners in every province wrote the test in their home language. This varied from 82% in the Eastern Cape and Limpopo to 40% in Gauteng. Learners writing in the same language in the Western Cape achieved the highest scores (379, SE=8.9) compared to all provinces.

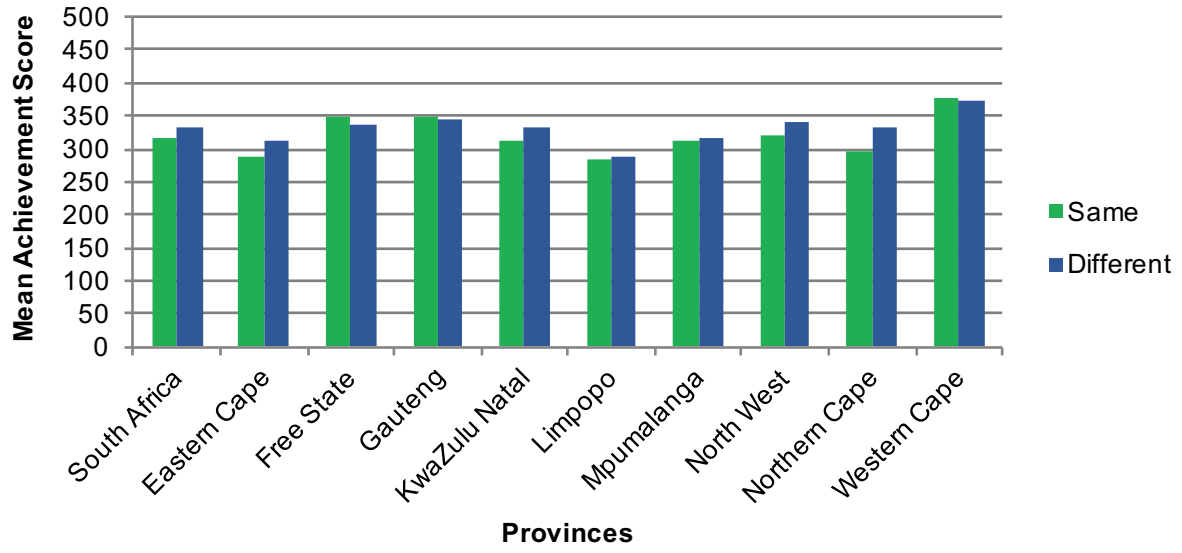


Figure 4.12: South African Grade 4 Learner Achievement in PIRLS literacy 2016 by the same language as the Test Language or different to their Home Language by Province

In six out of nine provinces, learners who wrote in their second language (different) achieved higher scores. Whilst overall nationally, learners writing in a different language to their home language achieved higher scores, this was not the case in all provinces. No statistical difference was found within provinces with the exception of the Northern Cape where 26% of learners wrote in a different language to their home language and achieved significantly higher results (335, SE=12.5) than those writing in their first language (298, SE=13.8). There was considerable variation in the mean scores for some groups writing in their second language (for example, Eastern Cape, KwaZulu Natal, Gauteng) as indicated by the large standard errors.

Table 4.3: South African Grade 4 Learners Achievement in PIRLS literacy by Province in a language the same as or different to their Home Language

Province	Home vs Test Language	Percentage of Learners	%SE	Mean Score	SE	Significance
South Africa	Same	71%	1.4	315	4.1	▼
	Different	29%	1.4	333	7.5	▲
Eastern Cape	Same	82%	2.0	287	13.7	●
	Different	18%	2.0	312	27.0	●
Free State	Same	75%	3.8	351	16.3	●
	Different	25%	3.8	338	11.7	●
Gauteng	Same	40%	5.8	349	19.8	●
	Different	60%	5.8	344	18.1	●
KwaZulu Natal	Same	75%	2.9	311	5.6	●
	Different	25%	2.9	333	11.3	●
Limpopo	Same	82%	3.9	284	4.9	●
	Different	18%	3.9	287	15.8	●
Mpumalanga	Same	68%	4.0	311	8.5	●
	Different	32%	4.0	316	16.8	●
North West	Same	73%	4.7	321	15.8	●
	Different	27%	4.7	340	15.5	●
Northern Cape	Same	74%	5.7	298	13.8	▼
	Different	26%	5.7	335	12.5	▲
Western Cape	Same	79%	3.1	379	8.9	●
	Different	21%	3.1	375	12.6	●

▲ Significantly higher than ▼ Significantly lower than ● Not significantly different
Significance level < 0.05

4.7 South African Achievement in Reading Purposes for PIRLS Literacy

As discussed in Chapter 3, PIRLS Literacy assessed two different reading purposes, the literary and informational. Both the prePIRLS and PIRLS 2011 assessments focus on two purposes for reading, namely reading for literary experience and reading to acquire and use information. Each of these is often associated with specific types of text; for example, fictional material for literary purposes and expository, informational articles or instructional texts for informational purposes. The PIRLS Literacy 2016 assessment takes the form of fictional passages when reading for the purposes of literary experience, and informational articles for the purposes of reading to acquire and use information.

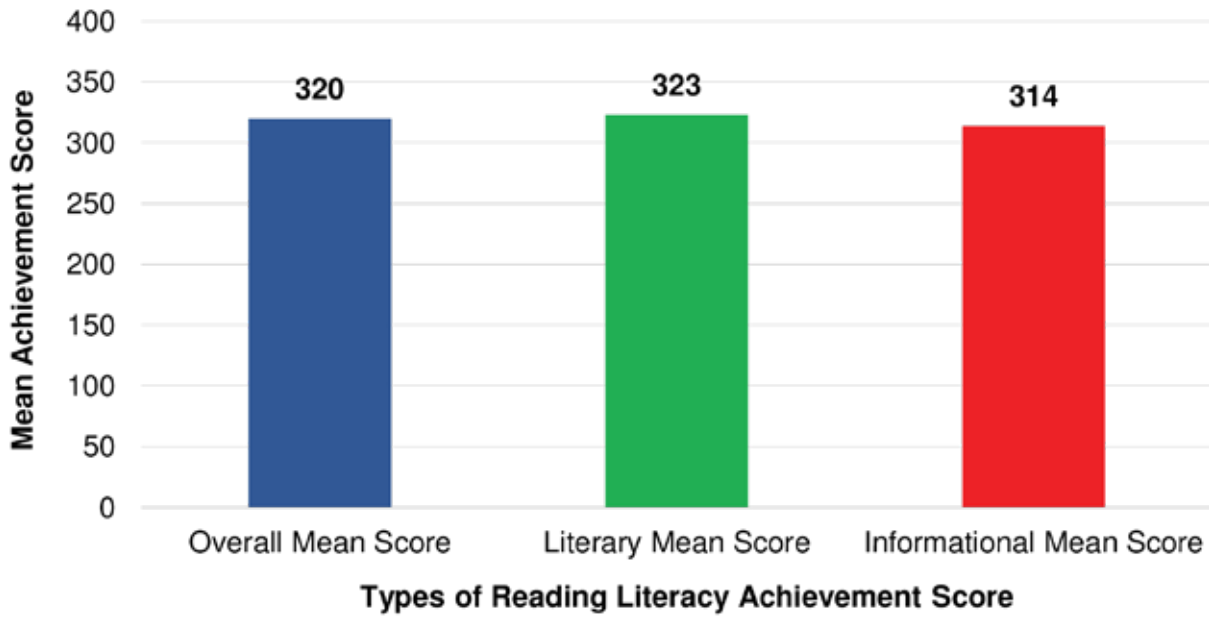
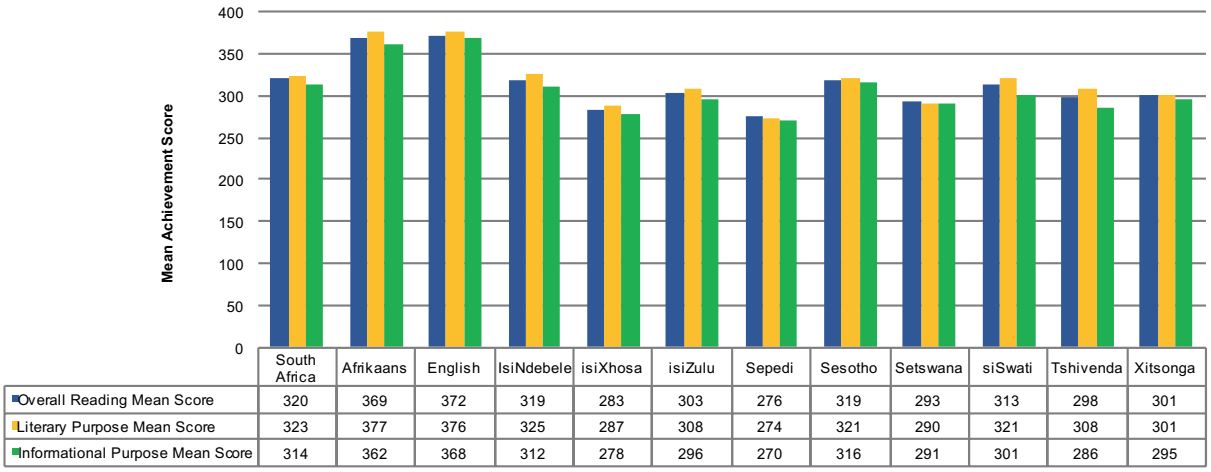


Figure 4.13: South African Grade 4 Learner Overall Mean Score and Achievement in Reading Purposes in PIRLS Literacy 2016

The average achievement of the South African Grade 4 learners for literary purposes (323, SE=4.7) was statistically higher than the overall PIRLS mean score and the informational purposes (314, SE=4.5) was significantly lower than the PIRLS overall mean score. This was similar to Belgium (French-speaking), Chile, Germany, Northern Ireland, New Zealand and the USA, amongst others. The South African achievement was similar, although learners obtained slightly lower scores to those in 2011 (see Chapter 6).

There are differences in achievement across languages when the purposes for reading are analysed, as shown by a comparison between reading purpose scores and overall scores in Figure 4.14. In general, learners in all languages achieved higher scores in the literary items, except for Setswana, where the performance was similar for both purposes.



	South Africa	Afrikaans	English	IsiNdebele	isiXhosa	isiZulu	Sepedi	Sesotho	Setswana	siSwati	Tshivenda	Xitsonga
Overall Reading Mean Score	320	369	372	319	283	303	276	319	293	313	298	301
Literary Purpose Mean Score	323	377	376	325	287	308	274	321	290	321	308	301
Informational Purpose Mean Score	314	362	368	312	278	296	270	316	291	301	286	295

Figure 4.14: Average Achievement of South African Grade 4 Learners in PIRLS Literacy 2016 for Reading Purposes by Test Language

The differences in achievement in purpose (see Figure 4.15) compared to the overall mean score ranged from -3 points (Setswana) to 10 (Tshivenda) for the literary purposes above the overall mean score and from -2 (Setswana) to -12 points (Tshivenda) the latter achieving 12 points less for informational purpose than for the overall mean score.

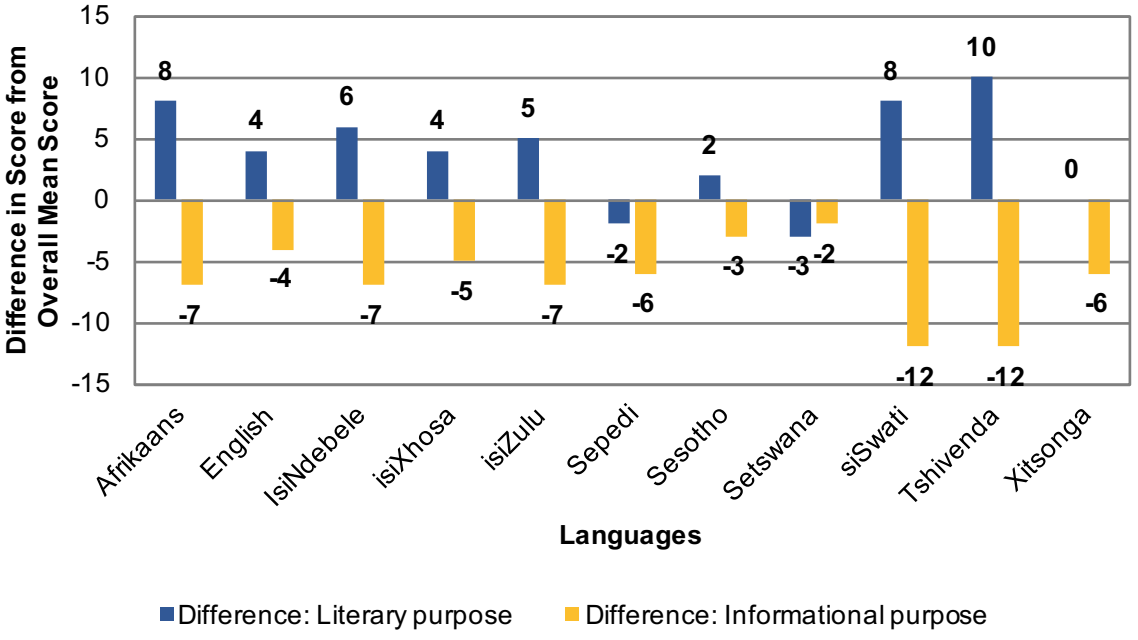


Figure 4.15: Differences in South African Grade 4 Learner Achievement Scores between Reading Purposes and Overall Mean Scores for each Test Language

Likewise in the provincial achievement, learners achieved higher scores for literary purposes in general, with the exception of North West, where the performance was similar (see Figure 4.16).

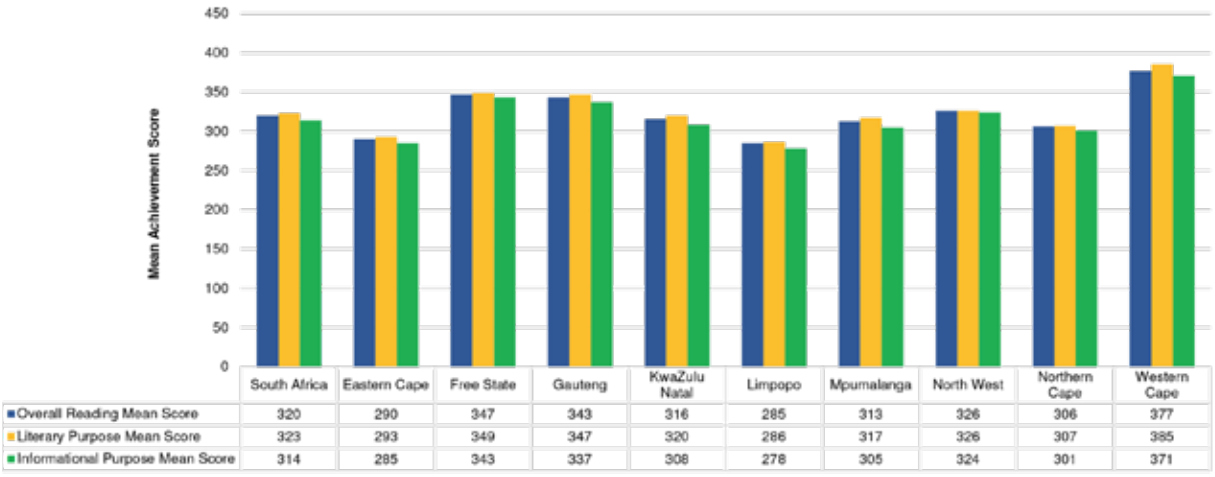


Figure 4.16: Average Achievement of South African Grade 4 Learners in PIRLS Literacy 2016 for Reading Purposes by Province

The differences in achievement in purpose (see Figure 4.17) compared to the overall mean score ranged from 0 points (North West) to 8 (Western Cape) for the literary purposes above the overall mean score and from -2 (North West) to -8 points (Mpumalanga and KwaZulu Natal) less for informational purpose than for the overall mean score. This may imply less exposure in certain provinces to informational texts than others.

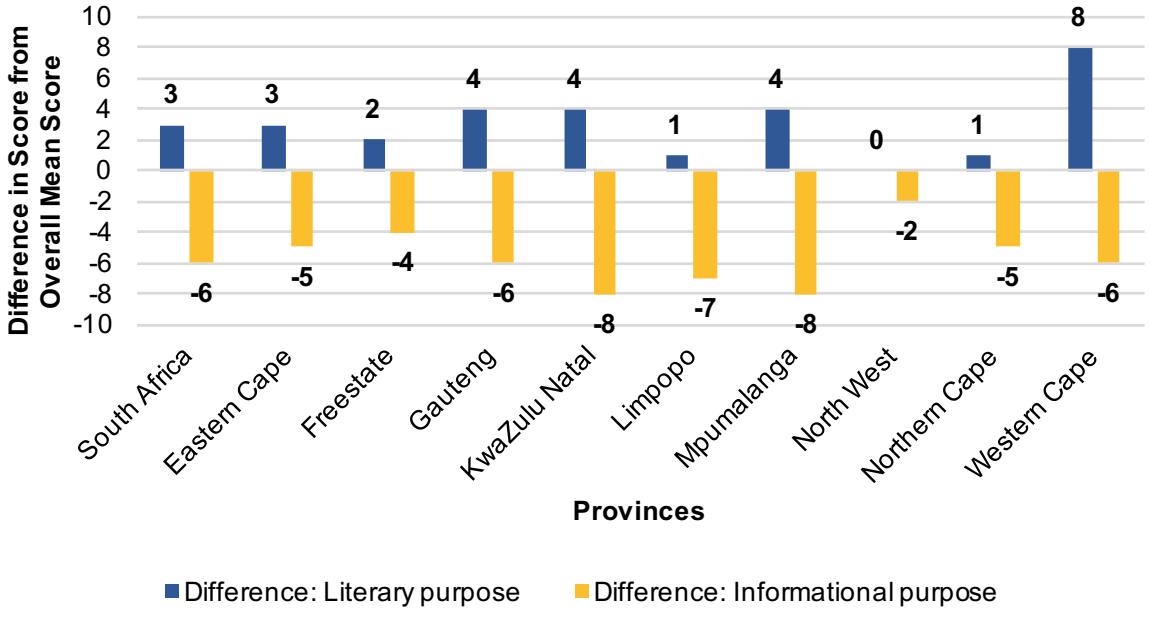


Figure 4.17: Differences in South African Grade 4 Learner Achievement Score between Reading Purposes and Overall Mean Score for each Province

The reading purposes was also analysed by gender (see Figure 4.18). Both boys and girls achieved better scores in the literary texts than in the informational texts. This was similar in 2011, although lower scores were achieved in 2016 (see Chapter 6).

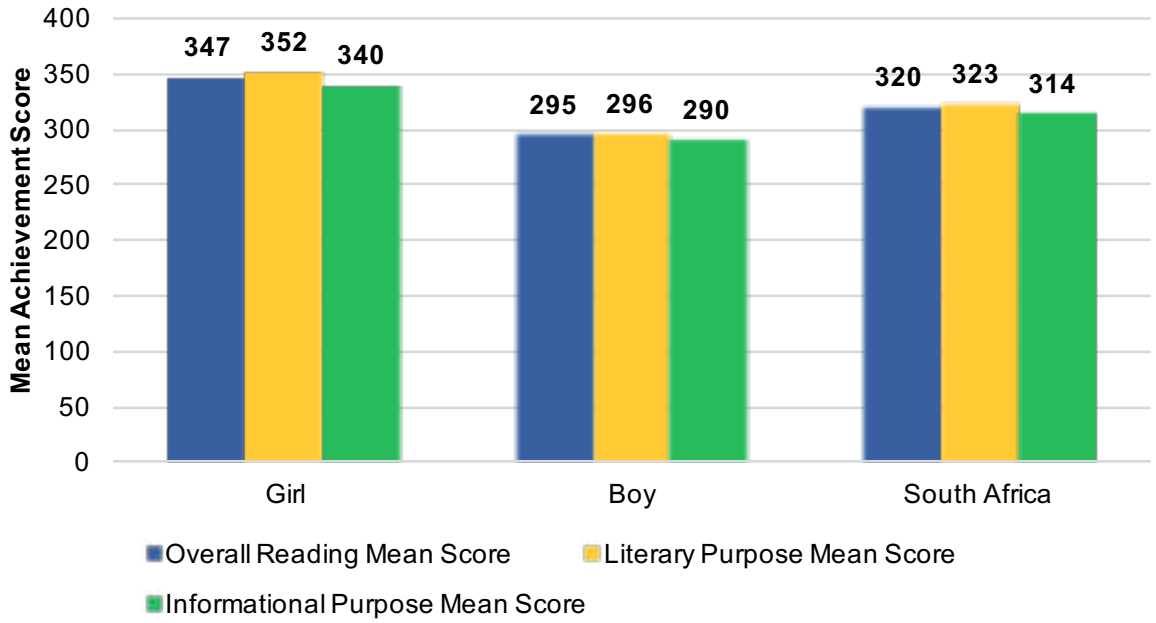


Figure 4.18: Average Achievement of South African Learners in PIRLS Literacy 2016 for Reading Purposes by Gender

However, the difference in the boys' scores was particularly small in the literary texts (see Figure 4.19) suggesting that girls may favour literary texts more than the boys. In contrast, girls obtained lower scores for the informational texts than the boys.

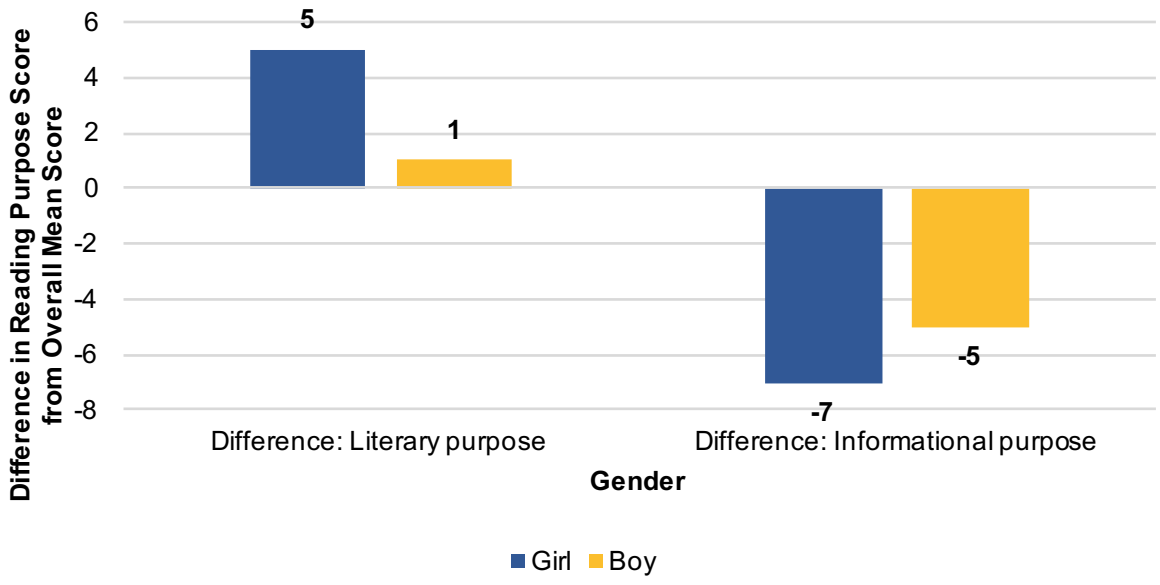


Figure 4.19: Differences in Achievement Scores between Reading Purposes and Overall Mean Score by Gender

4.8 South African Achievement in Reading Comprehension Processes for PIRLS Literacy

PIRLS Literacy, like PIRLS, assessed learner ability to undertake a number of reading comprehension processes. These included: Focus on and retrieve explicitly stated information, Make straightforward inferences, Interpret and integrate ideas and information; and Examine and evaluate content, language and textual elements (see Chapter 3 for details).

In Figure 4.20, the achievement of South African Grade 4 learners is presented for the combined processes Retrieving and Straightforward inferencing (which combined the lower order cognitive processes of focus on and retrieve explicitly stated information and make straightforward inferences) where learners achieved higher scores (321 points) and Interpreting, integrating and evaluating (which combined higher order cognitive processes Interpret and integrate ideas and information; and Examine and evaluate content, language and textual elements) where learners achieved a substantially lower score (308 points). South African learners performed better on lower order processes than higher order processes (a difference of 13 points) as had been the case in previous PIRLS cycles (see McLeod Palane, *in press*). This pattern of achievement was similar to that of 2011 although once again the scores were lower in 2016 (see Chapter 6).

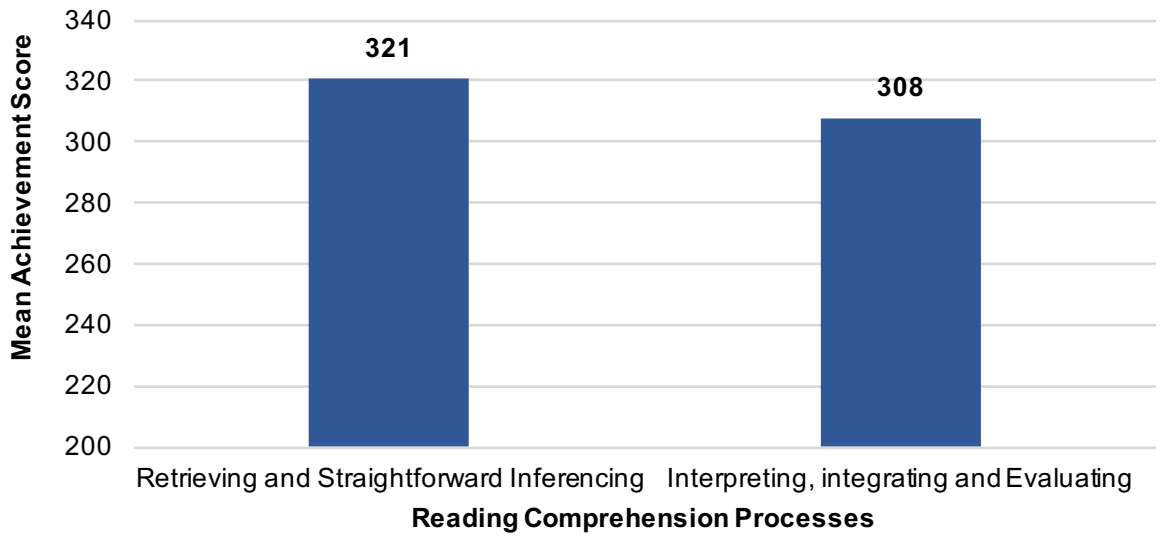


Figure 4.20: South African Grade 4 Learner Achievement by Comprehension Process

In almost all languages, except for Afrikaans and Tshivenda, South African learners performed consistently better on the lower order processes across languages (see Figure 4.21). Afrikaans and Tshivenda were the exceptions as their achievement on the higher order processes were similar to the lower order processes, although the achievement in Tshivenda was generally low. However, whilst the difference for those two languages was only two points, substantial differences were found in isiNdebele (29 points) and isiZulu (21 points) where higher order comprehension processes were found much more demanding by learners in those languages. The results suggest that learners in Afrikaans and English (where the difference was only 5

points) are achieving greater and deeper understanding of the texts and are able to comprehend higher order questions far better, relative to learners in other languages.

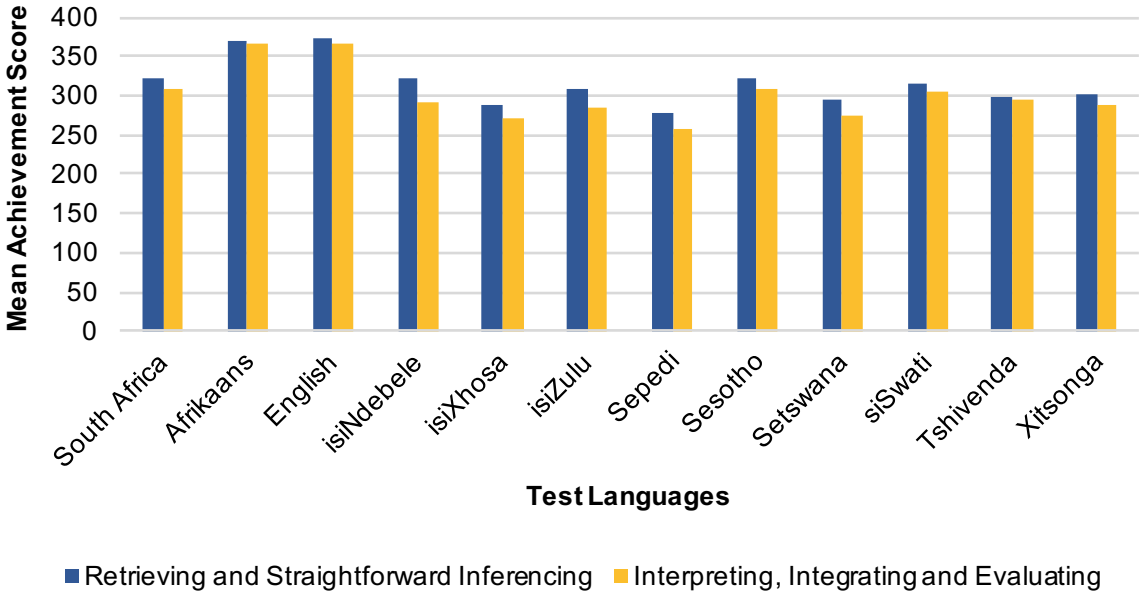


Figure 4.21: South African Grade 4 Learner Achievement on Reading Comprehension Processes by Language

South African learners performed consistently better on the lower order processes in eight out of nine provinces (see Figure 4.22). The Western Cape was the exception as their achievement on the higher order processes was similar to the lower order processes. However, whilst the difference for the Western Cape was a mere three points, substantial differences were found in KwaZulu Natal (17 points), and Mpumalanga and North West (16 points) where higher order comprehension processes were found more demanding by learners.

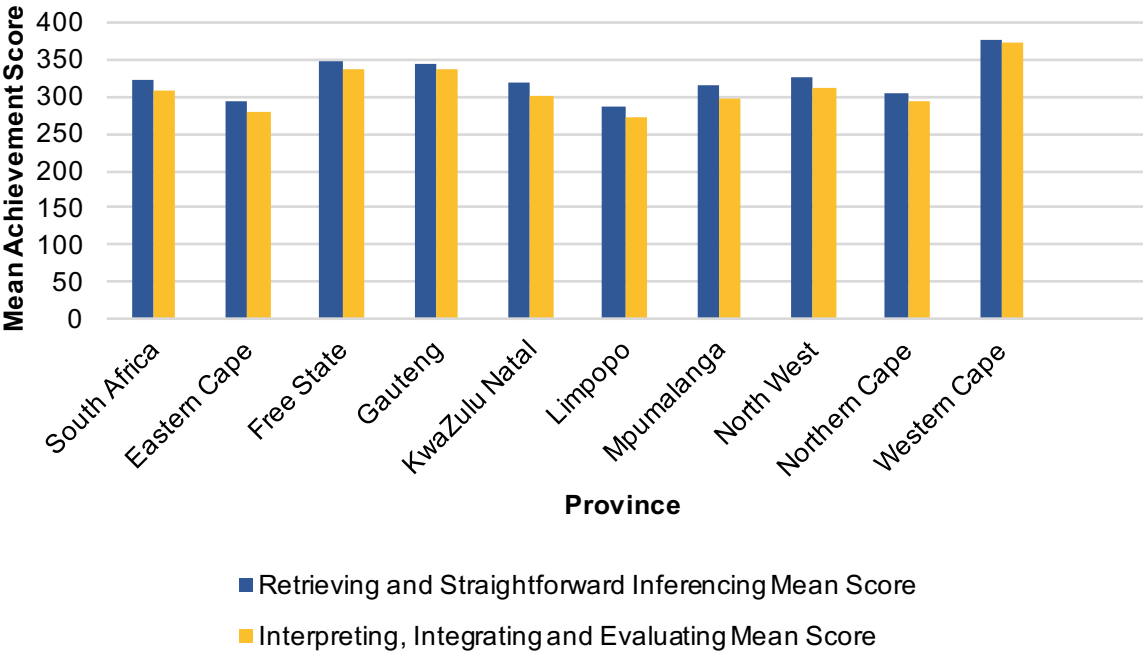


Figure 4.22: South African Grade 4 Learner Achievement on Reading Comprehension Processes by Province

Boys and girls performed differently on the lower and higher order comprehension processes see Figure 4.23). Whilst boys performed significantly below the girls overall, they scored 51 points less on the lower order *Retrieving and Inferencing* and 57 points less on the higher order *Interpreting, Integrating and Evaluating* Questions. Boys appeared to find the higher order items more challenging and obtained 16 points less than on the lower order questions.

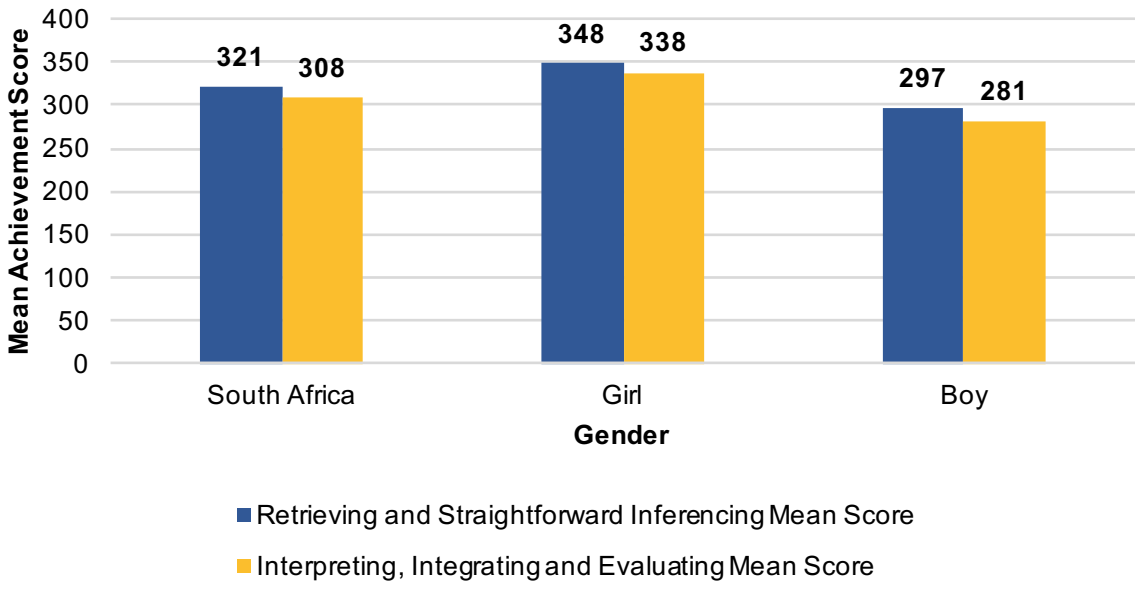


Figure 4.23: South African Grade 4 Learner Achievement on Comprehension Processes by Gender

Interpreting, integrating and evaluating are crucial reading comprehension skills which learners require throughout their schooling career. Therefore, it is recommended that teachers place more emphasis on higher order reading comprehension skills. This should start in the Foundation Phase, and in schools where the emphasis on higher order comprehension processes are placed in earlier grades, learners perform better in reading literacy comprehension.

4.9 Conclusion

Although the Grade 4 learners wrote the PIRLS Literacy test, their results could be compared to those learners internationally who wrote the more difficult PIRLS test, in addition to the other countries that wrote PIRLS Literacy. The South African learner achievement scores were low compared to other countries participating in PIRLS Literacy and very low once placed on the PIRLS scale with all countries in PIRLS Literacy and PIRLS, more than 250 points below the top performing countries and 180 points below the international centre point. The only comparable country was Egypt.

The national achievement varied considerably between the highest performance found in the Western Cape and the lowest performance in Mpumalanga. Girls achieved significantly higher scores than boys following the international trend with South Africa exhibiting the second largest gender gap internationally. This performance was consistent across the 11 languages with the largest gender gap found in Sepedi and Xitsonga.

Likewise across the test languages, significant differences were found with learners writing the test in English being the highest and those writing the test in Sepedi achieving the lowest scores, and the latter performing significantly below all other languages. A review of the distribution of the scores within each language revealed greater variations in Afrikaans and English achievement compared to the other languages and exceptionally low achievement at the 5th percentile of the isiXhosa learners. In almost all languages, most learners spoke the language of the test at home and in six languages performed better than those who did not speak the language at home. Learners who were second language speakers in Afrikaans and English achieved higher scores (in most cases more than 50 points) than first language speakers in all other languages. In six provinces, learners who wrote in a different language to the test language, performed better than those writing in their home language.

In South Africa, learners did better in the literary reading purposes than the informational, the exceptions being learners who wrote in Setswana and learners writing in North West, where there was no difference found. South African learners performed better on lower order questions compared to higher order processes. Exceptions were found in Afrikaans, English and Tshivenda where differences were small and in the Western Cape, where the performance was similar for learners on both lower and higher order questions.

In summary, the best performing groups of learners were girls. Learners in the Western Cape, writing the test in English and Afrikaans and who attended schools in more urbanised areas, had overall higher achievement. The most at risk learners were boys in remote rural areas, particularly in Limpopo and the Eastern Cape and those learners writing in African languages and never speaking the language of the test at home. In general, South African learners do better on literary-based texts and lower order questions.

In Chapter 6, the differences in achievement in PIRLS Literacy 2016 and earlier studies are presented, whilst greater insight into the South African learner achievement is described in Chapter 5 in terms of learner achievement on the international benchmarks.

CHAPTER 5: GRADE 4 PIRLS LITERACY 2016 BENCHMARK ACHIEVEMENT

Celeste Combrinck, Karen Roux and Sarah Howie

5.1 The Benchmarks and their Interpretation

Averages of achievement may be enlightening about how well children read in comparison to others and these averages allow for comparison of individuals, schools, districts, provinces and even countries (Scherman, Bosker & Howie, 2017). However, educators need more than just numbers; they need to know what those numbers signify and criterion-referencing provides a process of examining questions that were easier, moderately difficult and very difficult for children completing the test (Meyer, Doromal, Wei & Zhu, 2017; Popham, 2014). When educational specialists collectively examine the test questions, they consider: If a child got this question right, what reading skill did he or she have? Looking at test questions in this way, allows one to see what reading skills children have gained and what they still need to acquire, learn and develop.

The aim of the PIRLS International Benchmarks is to offer a description of what children can do at each benchmark in terms of reading comprehension skills. The benchmarks provide a global picture of the reading abilities children in South Africa have acquired and developed, as well as the abilities they still need to learn. In addition, benchmarks are a tool for teachers, district and provincial officials as well educational departments to plan for training and interventions. Benchmarks shift the focus from the reading literacy achievement to ways in which reading literacy can be improved.

The PIRLS Literacy assessment framework was set up to determine how well children read different types of texts which include fiction (literary) and non-fiction (informational). Half the texts are fiction and the other half non-fiction. Within those two categories of text, comprehension processes, which follow the cognitive development of young children's reading experience (Mullis & Martin, 2015), are assessed. PIRLS Literacy mirrors PIRLS, but is composed of easier texts and questions (Mullis & Martin, 2015). In PIRLS Literacy, the passages are shorter, tend to comprise more straight-forward inference questions and give researchers the opportunity to study reading literacy development of those at the lower end of the reading comprehension scale. Figure 5.1 shows the benchmarks in terms of the score point ranges for each benchmark, as well as the reading literacy skills demonstrated at each level.

	Benchmark Description
4 **Advanced International Benchmark** **625 and above score points**	***When reading Literary texts, learners can:*** • Integrate ideas and evidence across a text to appreciate overall themes • Interpret story events & character actions, provide insights that are text based ***When reading Informational texts, learners can:*** • Distinguish and interpret complex information from different parts of text • Integrate information across a text to provide explanations, interpret significance and sequence activities
3 **High International Benchmark** **550 - 625 score points**	***When reading Literary texts, learners can:*** • Identify significant events & actions • Make inferences & explain relationships, give text-based support • Identify significance of events, recognise language features (tone) ***When reading Informational texts, learners can:*** • Locate relevant information within complex text or table • Make inferences & logical connections to provide explanations • Evaluate content & make generalisations
2 **Intermediate International Benchmark** **475 - 549 score points**	***When reading Literary texts, learners can:*** • Retrieve & reproduce explicit information • Make straight-forward inferences about character feelings, motivations • Interpret obvious reasons and causes, give basic explanations ***When reading Informational texts, learners can:*** • Locate & reproduce 2-3 pieces of information from text • Use sub-headings, figures & text boxes to locate information • Retrieve & reproduce explicit information
1 **Low International Benchmark** **400 - 474 score points**	***When reading Literary texts, learners can:*** • Locate and retrieve explicitly stated information ***When reading Informational texts, learners can:*** • Locate & retrieve 2-3 pieces of information in text • Find information in text boxes, headings and figures

Figure 5.1: International Benchmarks of PIRLS Literacy Reading Achievement

The section below offers examples of questions and their answers relating to each of the benchmarks, giving the reader an idea of what is expected at each benchmark. Approximately half of the questions are multiple choice (MC) type items, and the other half are constructed response (CR) (Mullis & Martin, 2015).

Example of Low International Benchmark Question

1. Where does the boy find the pearl?

   Ⓐ on the beach

   Ⓑ beside the sea

   Ⓒ where they played games

   ● in the deeper water

Example of Intermediate International Benchmark Question

16. What does the oxpecker do to warn the rhino of danger?

1 it makes loud noises and hisses

Example of High International Benchmark Question

8. Find the part of the story by this picture of Granny Gunn:  .
Why did Granny Gunn wink and grin at the little boy?

1 Because the child gave her a good idea

Example of Advanced International Benchmark Question

7. The color of a hatchling's shell protects it from predators.

Give a way it is protected from birds.

1 The dark color of the top part blends in with the water when viewed above.

Give a way it is protected from sharks.

1 The bottom is white so sharks may not spot her in the sunlight

Size font differs from the instrument

At the Low International Benchmark, between 400 and 474 mean achievement score points, the learner can read to locate and retrieve explicit information. This benchmark is the most basic level of reading for meaning. Learners falling below the lowest benchmark cannot read for meaning or retrieve basic information from the text to answer simplistic questions.

At the Intermediate Benchmark (475-549), learners begin to interpret and identify obvious reasons for what is happening in the text as well as giving basic explanations for actions or information.

The High International Benchmark is between 550 and 625 score points. At this level, learners begin to make intricate connections between events in the text. They can identify crucial features and, in addition, can make generalisations while interpreting complex text and tables and giving evidence for their conclusions from the text.

The Advanced International Benchmark (625 and above score points), is the level at which learners integrate ideas as well as evidence across a text to appreciate overall themes, understand the author's stance and interpret significant events.

5.2 The Grade 4 PIRLS Literacy International Benchmark Attainment

The following section presents results in terms of the percentage of South African learners who attain the various international benchmarks[16] (see Figure 5.1). The results are presented in two types of formats:

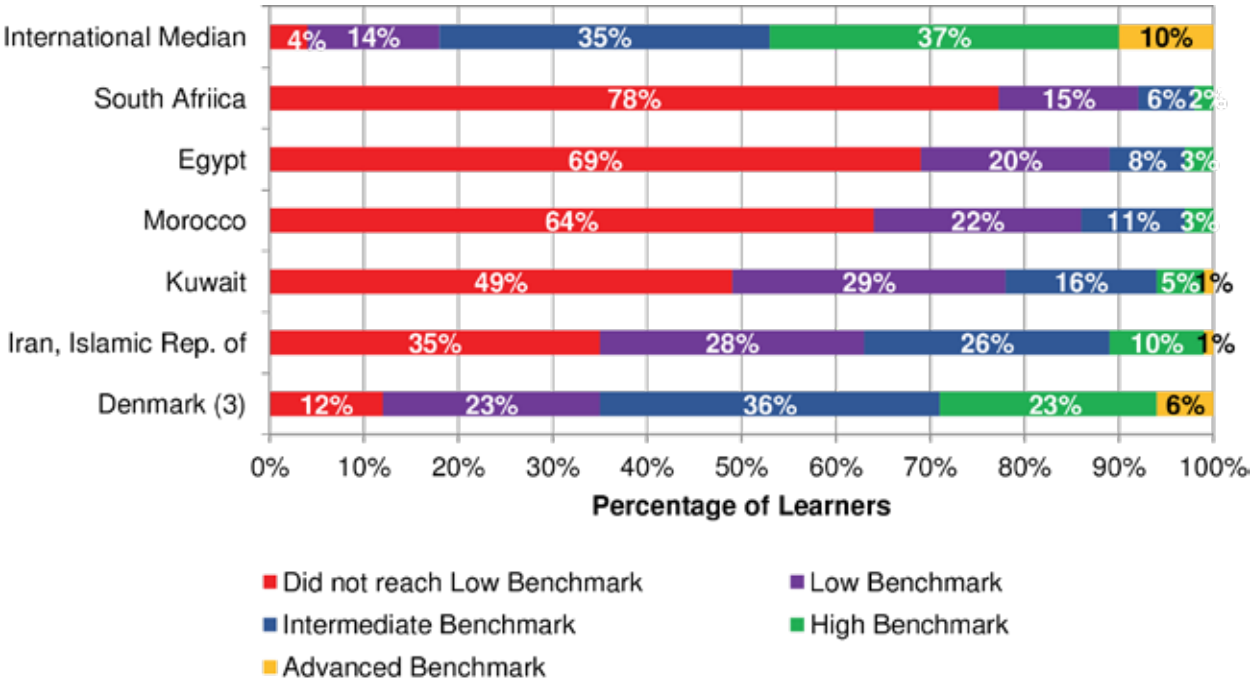
1. **As discrete percentages:** When the benchmarks are represented as discrete categories, the percentage of all Grade 4 South African learners who can achieve each benchmark are shown in the table or graphs (see Figure 5.2 as example).
2. **As cumulative percentages:** When benchmarks are represented as cumulative percentages, each category is shown as the percentage that can achieve the benchmark as well as all categories of learners that are able to attain the lower benchmarks.

5.2.1 PIRLS Literacy Grade 4 Benchmark Achievement: South Africa and International

When comparing the South African results to the international results, the PIRLS Literacy learners from South Africa are the least likely to achieve the higher benchmarks. In Figure 5.2, the discrete percentages of learners able to achieve the benchmarks are shown for the PIRLS Literacy participating countries.

[16] Percentages represent the population and not sample n (sample extrapolated to population)

Figure 5.2, reaching the lowest benchmark as compared to not reaching the lowest benchmark, illustrates the South Africa and the international median.



Note: 0.2% of South African learners reached the Advanced Benchmark but this cannot be depicted on this graph

Figure 5.2: International Benchmarks reached per PIRLS Literacy Country (as Discrete Categories)

As shown in Figure 5.2, 78% of South African Grade 4 children were not able to reach the lowest benchmark. Learners who did not reach the lowest benchmark could not locate explicit information or reproduce information from a text at the end of Grade 4. The lack of ability to correctly answer basic questions could indicate an inability to read on their own and/or understand basic text. It could also indicate a lack of ability to complete a test (not test wise).

Out of the five participating countries, Egypt's results are the closest to the South African benchmark achievement results while Denmark (Grade 3 PIRLS Literacy participant) had the greatest percentage of learners in the Advanced Benchmark (6%). In South Africa, only 2% of the children reached the High Benchmark and were able to distinguish and interpret complex information, integrate ideas and interpret complex text. While 2% of learners reached the High Benchmark, only 0.2% of Grade 4 South African learners were able to reach the Advanced Benchmark (Advanced Benchmark not shown on graph due to the small percentage).

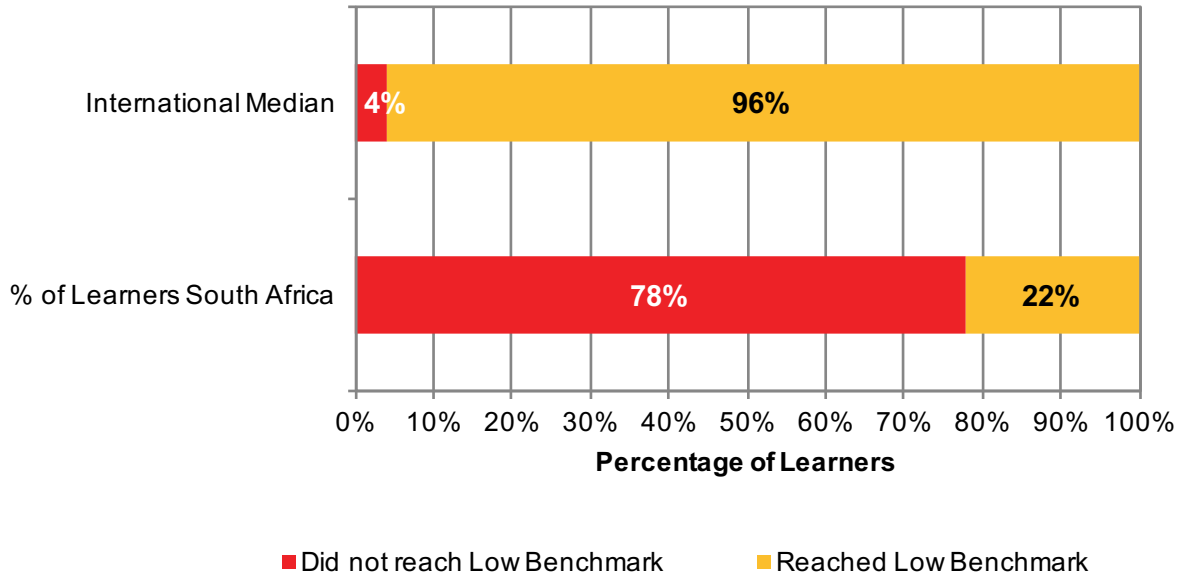
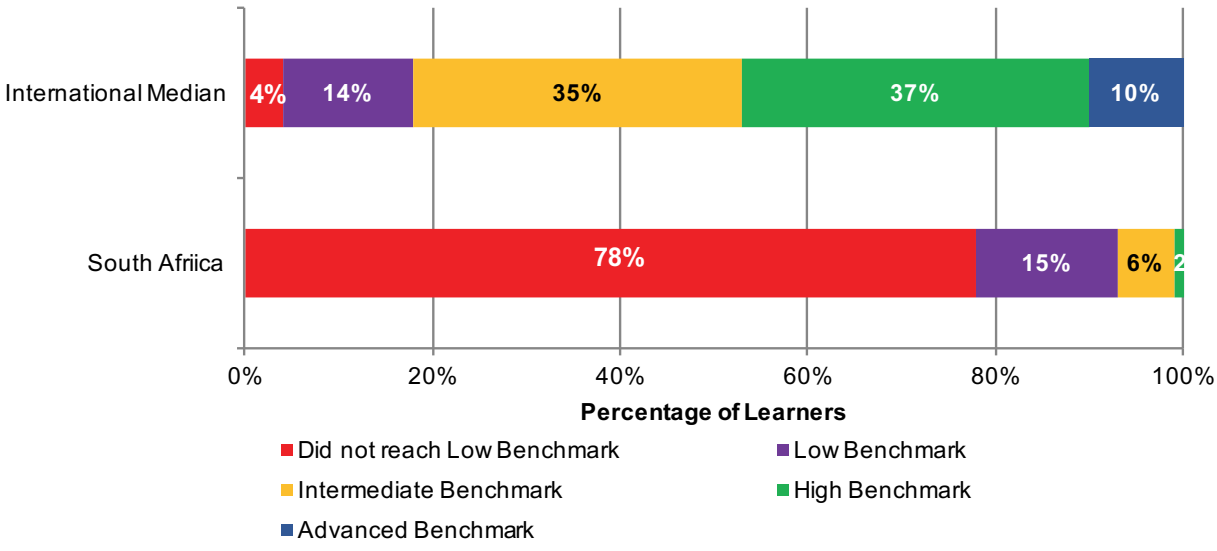


Figure 5.3: South African and International Learners not reaching the Low International Benchmark

Figure 5.3 reveals that in South Africa, 78% of learners did not reach the lowest benchmark, in comparison to only 4% of learners not reaching the lowest benchmark internationally.

In Figure 5.4, the discrete percentages of learners who reached the benchmarks are shown for South Africa compared to the overall international achievement.



Note: 0.2% of South African learners reached the advanced benchmark but this cannot be depicted on this graph

Figure 5.4: Discrete Categories of South African and International Learners who Did Not Reach The Low Benchmark And Those Who Reached It.

The percentage of learners falling within the Low Benchmark is the same for South Africa (15%) as for the international population (15%). However, for the Intermediate, High and Advanced Benchmarks, fewer learners in South Africa were able to reach these benchmarks when compared to the overall international achievement. Internationally, 10% of learners achieved the

Advanced Benchmark, whereas less than 1% of South African learners were able to reach this benchmark (0.2%). Table 5.1 below shows the cumulative percentages of South African learners who reached the benchmarks in comparison to the international achievement of benchmarks.

Table 5.1: International Benchmarks attained by South African Learners and International Median

Benchmark	% of South African Leraners	International Median
Low Benchmark	22.1%	96.0%
Intermediate Benchmark	7.6%	81.0%
High Benchmark	1.9%	47.0%
Advanced Benchmark	0.2%	10.0%

While 22% of South African learners reached the Low Benchmark, in contrast, internationally 96% of learners reached the Low Benchmark. Internationally, 47% of all learners reached the High Benchmark cumulatively compared to South African learners, where only just less than 2% were able to reach this benchmark. Comparing the attainment of international reading achievement by benchmark, South Africa faces many educational challenges as a developing country and raises concerns about the teaching of reading literacy in schools.

5.2.2 Benchmark Achievement for Grade 4 PIRLS Literacy per Language

Table 5.2 below shows the cumulative percentages of children per language group who reached each of the benchmarks for Grade 4 PIRLS Literacy.

Table 5.2: Cumulative Percentage of Learners who reached Benchmarks per Language in PIRLS Literacy Grade 4

	Did Not Reach Low Benchmark	Reached Low Benchmark	Reached Intermediate Benchmark	Reached High Benchmark	Reached Advanced Benchmark
Sepedi	93.3%	6.7%	0.4%	0.0%	0.0%
Setswana	89.8%	10.2%	1.0%	0.1%	0.0%
Tshivenda	89.4%	10.6%	1.6%	0.1%	0.0%
isiXhosa	88.2%	11.8%	1.6%	0.0%	0.0%
Xitsonga	87.8%	12.2%	1.6%	0.1%	0.0%
isiZulu	86.9%	13.1%	1.3%	0.1%	0.0%
isiNdebele	86.5%	13.5%	0.7%	0.0%	0.0%
siSwati	83.6%	16.4%	2.0%	0.0%	0.0%
Sesotho	82.4%	17.6%	2.6%	0.0%	0.0%
English	56.9%	43.1%	20.8%	6.0%	0.8%
Afrikaans	55.9%	44.1%	20.0%	5.1%	0.3%
South Africa	**77.9%**	**22.1%**	**7.5%**	**1.9%**	**0.2%**

In Table 5.2, learners who wrote the test in English or Afrikaans were the most likely to reach the High Benchmark (5-6%). However, the results show that more than half the learners who completed the assessment in English (57%) or Afrikaans (56%) were unable to attain the lowest benchmark. In some of the African languages, very few learners were even able to reach the low benchmark, with only a meagre 7% of Sepedi participants reaching the low benchmark. For the nine African languages, the picture is dire, with 80% and more (Sepedi 93%) of African language learners not even attaining the lowest international benchmarks, which means they are unable to read for meaning in their African (home) language at the end of Grade 4.

5.2.3 Benchmark Achievement for PIRLS Literacy Grade 4 per Province

Table 5.3 below displays the cumulative percentages reached per province by the Grade 4 PIRLS Literacy learners.

Table 5.3: Cumulative Percentage of Learners who reached Benchmarks per Province in PIRLS Literacy Grade 4

	Did Not Reach Low Benchmark	Reached Low Benchmark	Reached Intermediate Benchmark	Reached High Benchmark	Reached Advanced Benchmark
Limpopo	90.8%	9.2%	1.0%	0.1%	0.0%
Eastern Cape	84.6%	15.4%	4.6%	0.8%	0.1%
Mpumalanga	82.9%	17.1%	4.4%	0.7%	0.1%
KwaZulu Natal	81.6%	18.4%	3.9%	0.7%	0.1%
Northern Cape	80.6%	19.4%	6.5%	0.9%	0.1%
North West	78.3%	21.7%	7.3%	1.9%	0.0%
Free State	73.4%	26.6%	8.7%	2.0%	0.1%
Gauteng	68.5%	31.5%	14.7%	4.7%	0.7%
Western Cape	55.0%	45.0%	19.0%	5.2%	0.6%
South Africa	**77.9%**	**22.1%**	**7.5%**	**1.9%**	**0.2%**

In every province, more than 50% of children were unable to reach the lowest benchmark and as such, do not seem to have basic literacy skills in place by the end of Grade 4. In the worst case in Limpopo, 91% did not reach the lowest benchmark. Whilst provinces vary greatly, the Western Cape, Gauteng and Free State were the provinces most likely to reach the benchmarks. However, more than 5% of learners in the Western Cape and Gauteng attained the two highest benchmarks while in six of the nine provinces, a fraction of learners achieved the Advanced Benchmark.

5.2.4 Benchmark Achievement in South Africa for Grade 4 PIRLS Literacy by Gender

The graph below (Figure 5.5) shows the differences in benchmark achievement in South Africa for boys compared to girls.

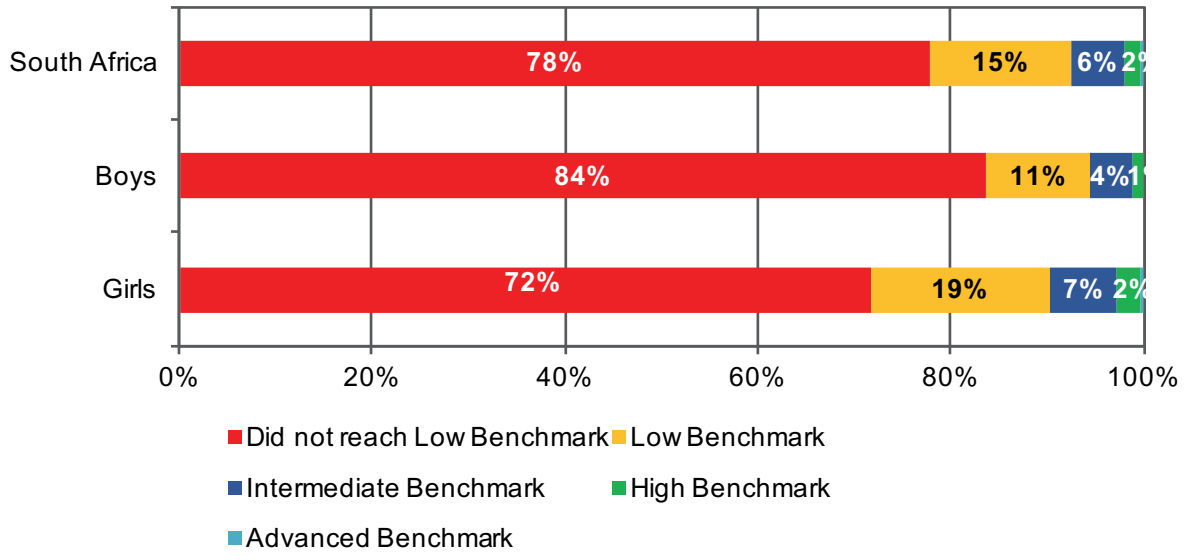


Figure 5.5: South African Boys compared to Girls in terms of reaching the International Benchmarks

In Figure 5.5, the most serious concern that arises is that 84% of boys did not reach the lowest benchmark, whereas 72% of girls were able to attain the lowest benchmark. Significantly more girls (10%) reached the top three benchmarks whereas only 6% of boys could achieve the higher benchmarks. Overall girls were more likely to attain each of the benchmarks when compared to boys. The lowest benchmark was reached by 19% of girls in that category, as compared to 11% of boys in that category while the advanced benchmark was reached by 0.3% of girls but by only 0.1% of boys. Boys may be an at-risk group in South Africa that would require additional and in-depth reading literacy interventions.

5.2.5 Benchmark Achievement for PIRLS Literacy Grade 4 by Location

Table 5.4 below presents the discrete categories of benchmarks attained per location.

Table 5.4: Discrete Categories of Benchmarks reached by Learners per Location

	Did Not Reach Low Benchmark	Low Benchmark	Intermediate Benchmark	High Benchmark	Advanced Benchmark
Remote rural	88.7%	9.9%	1.3%	0.1%	0.0%
Small town or village	84.9%	12.4%	2.4%	0.3%	0.0%
Township near urban area	82.6%	14.0%	3.1%	0.3%	0.0%
Urban–Densely populated	53.1%	23.7%	15.8%	6.3%	1.0%
Suburban–On fringe or outskirts of urban area	48.3%	23.1%	20.5%	7.5%	0.7%
Medium size city or large town	37.6%	28.7%	24.5%	8.6%	0.5%
South Africa	**77.9%**	**14.5%**	**5.6%**	**1.7%**	**0.2%**

Discrepancies in attainment of benchmarks was evident between learners living in the various types of residential areas found in South Africa, such as remote areas, small towns or villages, townships near urban areas, urban (densely populated) or suburban areas and mediums-sized cities and towns. Figure 5.6 below illustrates the international benchmarks reached by learners residing in the various areas of South Africa.

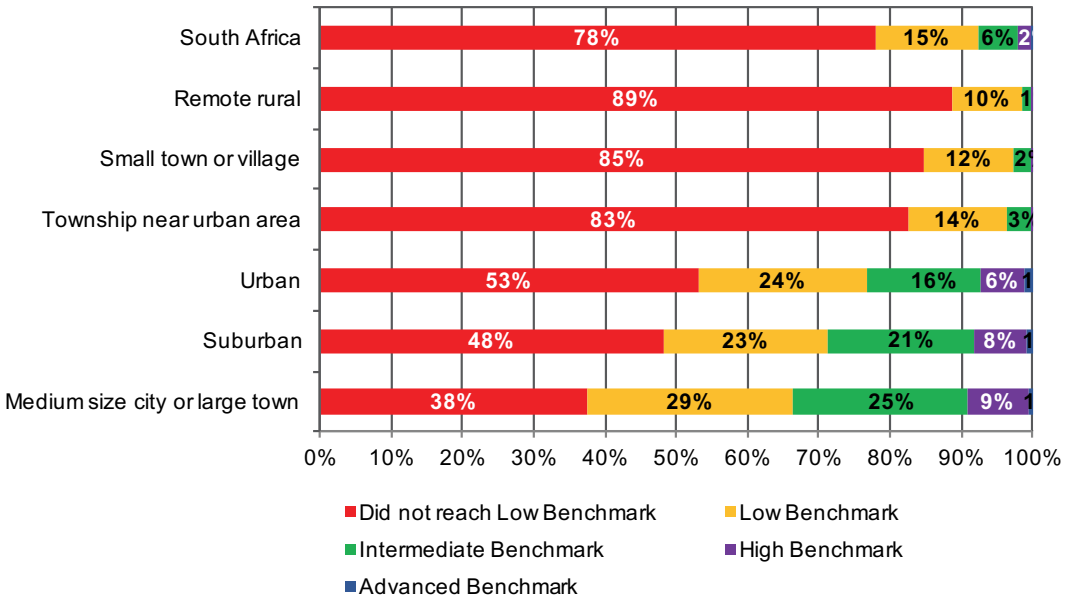


Figure 5.6: South African Grade 4 Learner Achievement of International Benchmarks per Location

Learners in medium-sized cities or large towns, suburban and densely populated urban areas were more likely to reach international benchmarks (see Figure 5.6). In small towns or villages (85%) and remote rural areas (89%), most of the learners were not able to achieve the lowest benchmark. In contrast, learners in densely populated urban areas (1.1%) and suburban areas (0.8%) were the most likely to achieve the advanced benchmark. About 8% of learners in medium-sized cities or large towns, suburban and densely populated urban areas were able to reach the top two benchmarks.

In Table 5.5, the International Benchmarks reached are shown per school Quintile classification (see Chapter 3 for more details about quintiles). The results in Table 5.5 show that Quintile 1-3 schools are similar in their attainment of the benchmarks, with Quintile 1-3 having a large percentage of learners (85% and more) that did not reach the lowest benchmark.

Table 5.5: South African Learners who reached the International Benchmarks per School Quintile

	Did Not Reach Low Benchmark	Reached Low Benchmark	Reached Intermediate Benchmark	Reached High Benchmark	Reached Advanced Benchmark
Quintile 1	88.6%	11.4%	1.3%	0.1%	0.0%
Quintile 2	87.0%	13.0%	1.7%	0.1%	0.0%
Quintile 3	85.2%	14.8%	2.7%	0.4%	0.0%
Quintile 4	76.2%	23.8%	6.4%	0.9%	0.1%
Quintile 5	35.1%	64.9%	38.0%	12.2%	1.6%
South Africa	**77.9%**	**22.1%**	**7.5%**	**1.9%**	**0.2%**

Quintile 4 schools recorded fewer learners not reaching the lowest benchmark (76%), whereas Quintile 5 schools are significantly different with only 35% of learners not reaching the lowest benchmark. In Quintile 5 schools, there are also a larger percentage of learners who were able to reach the High International Benchmark (12%) and the Advanced International Benchmark (1.6%).

Quintile information was not collected in PIRLS study but was obtained from EMIS database

5.3 Conclusion

The overall picture of the international benchmarks achieved by Grade 4 South African learners clearly points to lack of the most basic reading literacy skills. Overall South Africa recorded the highest percentage of learners not reaching the lowest international benchmark, even when compared to countries with similar mean achievement scores such as Egypt. Per language, learners tested in African languages demonstrated an inability to reach the lowest benchmarks, highlighting the need for focused interventions or additional support for these languages, in particular Sepedi. Results indicate that some provinces also need more support, such as Limpopo, Eastern Cape, Mpumalanga, KwaZulu Natal and Northern Cape where 80% or more of learners were unable to attain the lowest benchmark and read for meaning. Boys were identified as an at-risk group, with 84% of boys not reaching the lowest benchmark. As a result, boys may need more assistance and support to bridge the achievement gap. Learners attending schools in rural areas were also unable to attain the lowest benchmark (89%), followed by those living in small villages or small towns (85%) as well as learners attending schools in townships (83%). Learners attending schools situated in urban and suburban areas attained the lowest benchmarks with some, albeit few, reaching both the Intermediate and High Benchmarks (6-8%). Medium-sized cities or large towns recorded the highest percentage of learners attaining the international benchmarks, though it should be noted that they are a small percentage of the sample (6%).

Quintile 1 to 3 schools had high percentages of learners not reaching the lowest benchmark (more than 80%), whereas learners in Quintile 5 schools attained the Low Benchmark (65%) as well as the higher benchmarks. When taking into consideration that those learners living in rural areas or townships, attending schools in African languages, attending schools in Quintile 1 to 3 and boys have the lowest attainment of benchmarks, there seems to an indication of how severely issues of poverty, are affecting reading literacy in South Africa.

In the next chapter, the trends emerging from the 2011 and 2016 results for the PIRLS Literacy Grade 4 groups are discussed, including the benchmark achievement per cycles and commentary is given on how the picture has changed over the intervening years.

6 CHAPTER 6: PIRLS LITERACY 2006, 2011 AND 2016 GRADE 4 TRENDS IN READING LITERACY COMPREHENSION

Celeste Combrinck and Sarah Howie

6.1 PIRLS Literacy Trends Internationally

As discussed in Chapter 1, PIRLS Literacy, previously known as prePIRLS, was established in 2011 for countries where reading comprehension was in a developmental phase. PIRLS Literacy offers countries the opportunity to measure at the lower end of the scale. Although PIRLS Literacy has its own passages, it is linked to the PIRLS assessment with four passages (51 common questions). Two PIRLS Literacy passages were also included in the PIRLS assessment. South Africa is the only country that chose to participate in both prePIRLS 2011 and PIRLS Literacy 2016. Only a small, select number of countries chose to participate in prePIRLS 2011/PIRLS Literacy 2016 as is shown in Table 6.1.

Table 6.1: Country Participation in prePIRLS 2011 and PIRLS Literacy 2016

prePIRLS 2011	PIRLS Literacy 2016
South Africa Botswana Colombia	South Africa Denmark (Grade 3) Egypt Iran* Kuwait Morocco*

*Participated in both PIRLS and PIRLS Literacy and results are an average of both

Countries are given the option of participating in both PIRLS and PIRLS Literacy at two grades or one grade and thereby collect comprehensive information on how well learners read at different points in the educational system (Martin, Mullis & Hooper, 2017, p.3). By comparing results every 5 years, the trends offer countries the opportunity to:

- track learner reading comprehension within the system and to compare with other participating countries;
- assess the accomplishment of goals and standards set nationally;
- assess curriculum functioning to consider and inform reform;
- improve teaching and learning through research;
- conduct national studies to monitor equity and assess other grades; and
- train teachers and researchers in assessment, monitoring and evaluation.

6.2 PIRLS Literacy Trends in South Africa

South Africa has participated in three cycles, namely 2006, 2011 and 2016. The possible trend comparison, per round, is shown in Figure 6.1.

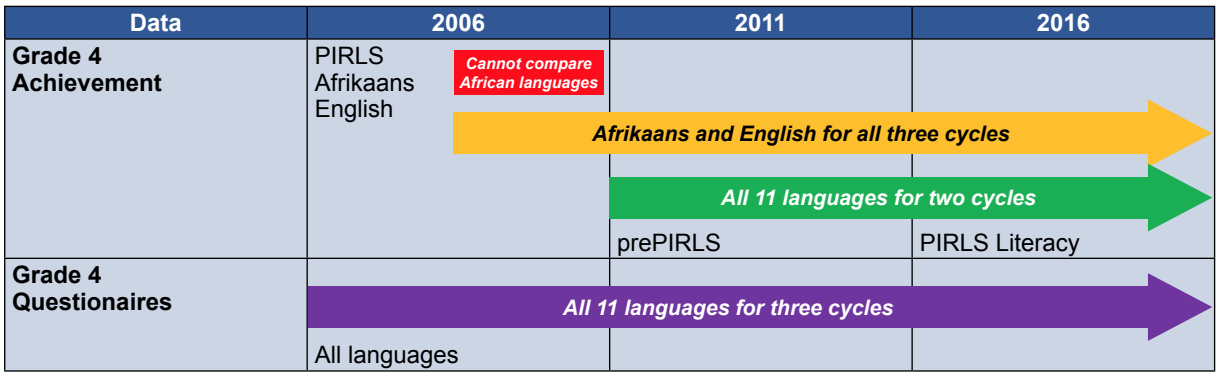


Figure 6.1: Trends possible for South African Data per Cycle of PIRLS

South African Grade 4 learners participated in prePIRLS 2011 and PIRLS Literacy 2016 for all 11 languages, as can be seen in Figure 6.1. This data provided the opportunity to compare achievement results for all official languages between 2011 and 2016. However, the 2006 South African Grade 4 participation achievement results cannot be used in trend analysis due to the very low mean scores which would cause unstable measurement for trend in the African languages. However, the Afrikaans and English Grade 4 results from 2006 were high enough and can be utilised for trend comparisons and in addition, comparison of contextual data (questionnaires) is possible between all languages for the three rounds. Contextual comparisons are possible providing questionnaire items, used in analysis, were not changed or removed between rounds.

The prePIRLS 2011 data have subsequently been rescaled to be aligned with the international PIRLS scale and as a result, can be compared to 2016 PIRLS Literacy results, as well as other countries which have nationally representative samples for the rounds (see Chapters 3 and 5 for more information).

6.3 PIRLS Literacy 2011 and 2016 South African Reading Achievement Trend Results

The following section presents the South African trend data from 2011 and 2016 as well as the Standard Errors (SE). It also indicates whether the changes were statistically significant. In Figure 6.2, the 2011 and 2016 average mean achievement for South Africa is shown.

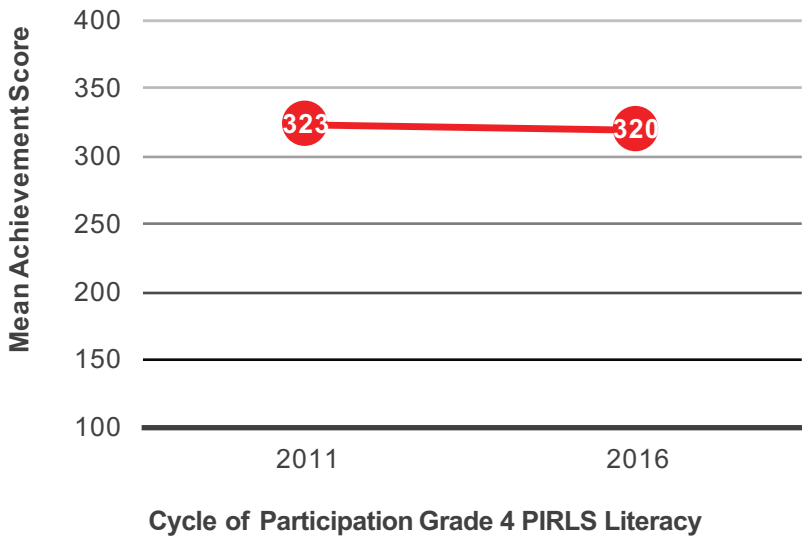


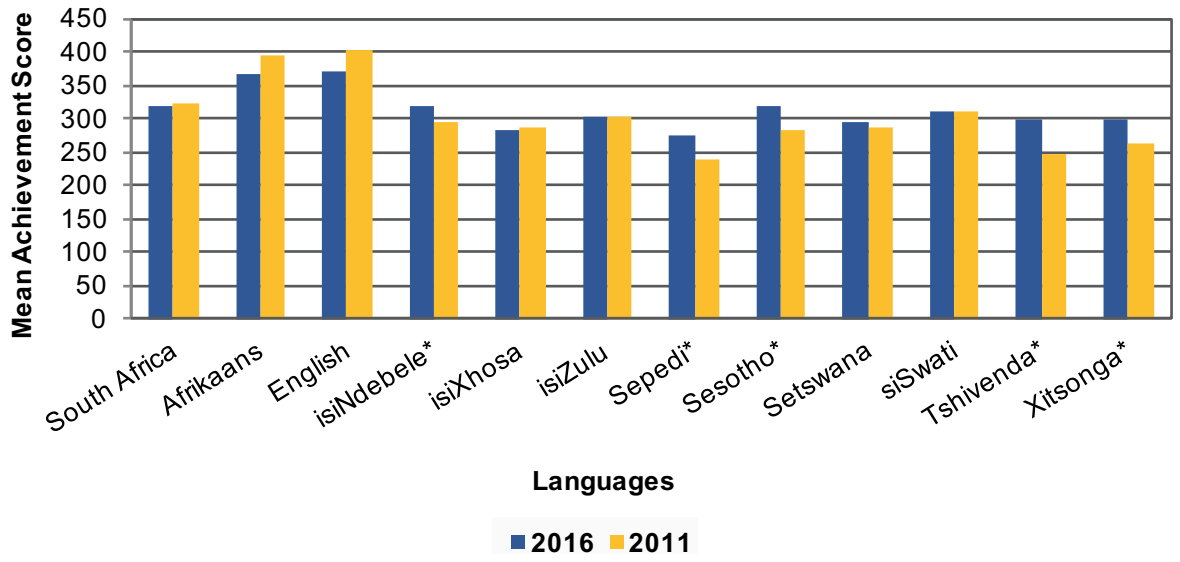
Figure 6.2: South African Overall Score for 2011 and 2016 Participation in PIRLS Literacy

For South Africa overall, there was no difference in the mean score between the two years. The 2016 average achievement was 320 score points (SE=4.4), but when compared to 2011 where the mean achievement was 323 score points (SE=4.3), the two rounds are not statistically different[17]. However, South Africa has many complex sub-samples within the overall sample, such as languages, provinces, areas of habitation and home versus school languages. Therefore, it is important to investigate all potential sub-populations to discover where changes, both positive and negative, tend to occur.

As representative sampling was done for languages in 2011 and 2016, languages can be compared. However, in 2011, a representative sample was not drawn for provinces and therefore such analyses are not shown in this chapter.

In Figure 6.3, a visual representation of the reading literacy average achievement can be seen for each language for 2011 and 2016. An asterisk next to the name of the language represents significant improvements.

[17] t-value being equal to -0,628, t-values greater than 1.96 is equal to the p level of 0.05



* Significantly higher.

Figure 6.3: PIRLS Literacy Grade 4 Achievement by Language for 2011 and 2016

In Table 6.2, the average mean achievement per language for 2011, compared to 2016 Grade 4 PIRLS Literacy, can be seen as well as the South African average.

Table 6.2: South African Achievement in 2011 and 2016 for Grade 4 per Language

	2011		2016				
Language	Average Achievement	SE	Average Achievement	SE	Difference	t-value	Significance
Afrikaans	397	11.6	369	13.4	-28	-1.72	●
English	403	11.6	372	14.4	-31	-1.68	●
isiNdebele	295	6.7	319	10.2	24	2.17*	▲
isiXhosa	287	12.2	283	11.1	-4	-0.22	●
isiZulu	303	10.0	303	4.3	0	0.00	●
Sepedi	241	8.5	276	6.5	35	3.26**	▲
Sesotho	283	8.4	319	6.2	36	3.72**	▲
Setswana	286	5.5	293	6.3	7	0.85	●
siSwati	313	6.3	313	7.3	0	-0.02	●
Tshivenda	249	8.7	298	7.8	49	4.44**	▲
Xitsonga	262	9.5	301	9.2	39	3.05**	▲
South Africa	**323**	**4.3**	**320**	**4.4**	**-4**	**-0.57**	●

*P<0.05 (t > 1.96) **P<0.01 (t > 2.58) ▲ Significant increase ● No significant difference

The mean achievement score point differences (and associated t-values) are also shown in Table 6.2 for all the languages and South Africa overall. Even though some languages, such as Afrikaans and English, have lower achievement scores for 2016 than for 2011, the differences in scores are not statistically significant[18] due to the large variation around the mean (large SEs). Five African languages, namely isiNdebele, Sepedi, Sesotho, Tshivenda and Xitsonga recorded statistically higher achievement in 2016 compared to 2011[19]. However, the five

[18] (-1.96 > t < 1.96)
[19] t > 1.96 ≈ p < 0.05

African languages, which registered an improvement, started from a very low base, resulting in a reduction in the large variation between African languages. Despite there being a slight decrease in the Afrikaans and English scores, and an increase in five African language scores, there is still a disparity between Afrikaans and English when compared to the African languages.

Achievement of girls and boys in PIRLS has been, over the rounds, quite significant. Table 6.3 shows the average achievement of girls compared to boys in the 2011 participation and the 2016 participation in PIRLS Literacy.

Table 6.3: South African Achievement in 2011 and 2016 for Grade 4 per Gender

	2011				2016			
Gender	% of learners	SE of %	Average Achievement	SE	% of learners	SE of %	Average Achievement	SE
Girls	48	0.7	341	4.5	48	0.7	347	4.0
Boys	52	0.7	307	4.9	52	0.7	295	5.1

The table above illustrates that the trend indicates a growing disparity between girls and boys. In 2011, the difference was a total of 34 score points whereas in 2016 this gap has increased to 52 score points. Within each cycle, the girls achieved significantly higher scores than the boys (see Figure 6.4). The increase of the achievement score for girls between 2011 (341) and 2016 (347) is not significant. The boys' achievement score between the two cycles is also not significantly different.

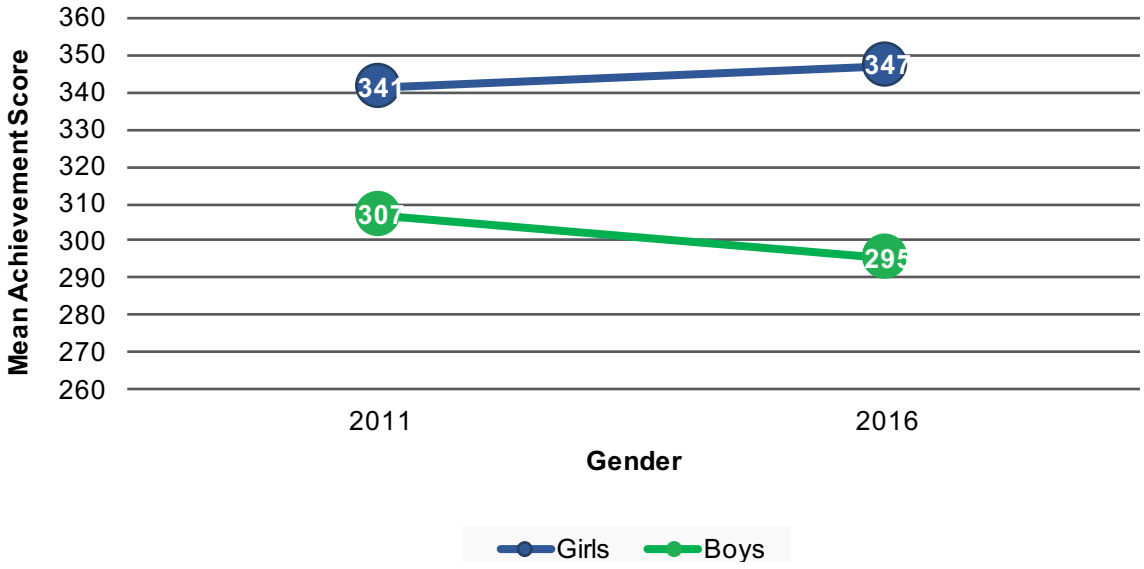


Figure 6.4: South African Grade 4 Learners Mean Achievement Scores by Gender

Percentage of learners reaching the international benchmarks gives a good indication of the level of reading literacy in the country and provides more insight into the knowledge and skills demonstrated by the learners (see Chapters 3 and 5 for details). Figure 6.5 shows the percentages of Grade 4 learners in South Africa who attained the international benchmarks per cycle for 2011 and 2016.

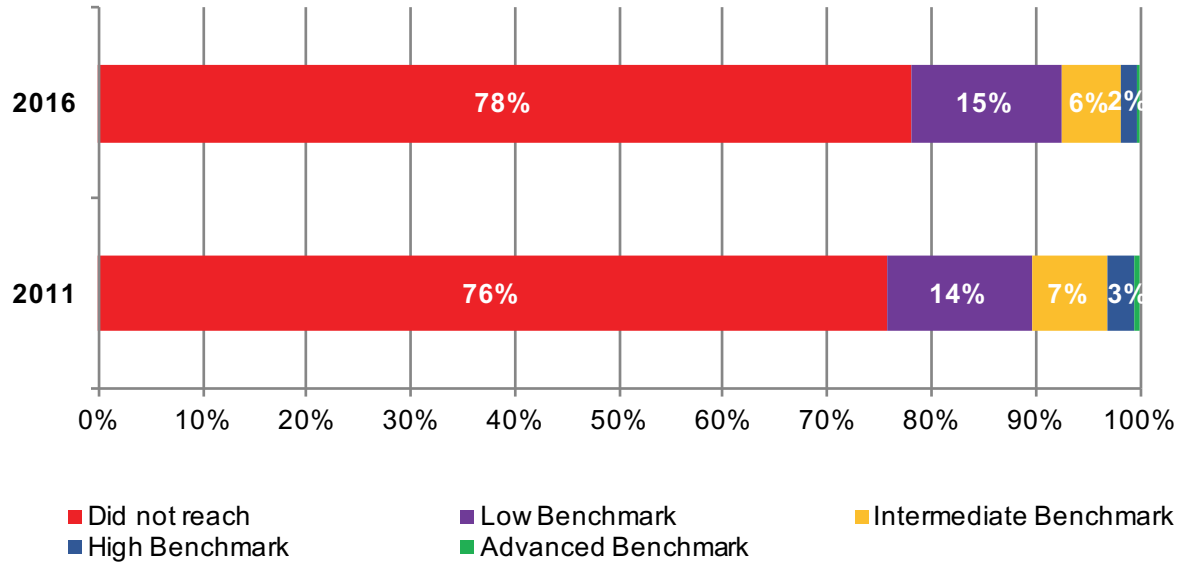


Figure 6.5: Attainment by South African Grade 4 Learners of International Benchmarks across Cycles

The 2016 and 2011 attainment of the international benchmarks by South African learners is similar for the two rounds of participation. The exact percentages attaining the benchmarks are shown in Table 6.4.

Table 6.4: South African Learners who attain the International Benchmarks for 2011 and 2016 Categorical

International Benchmarks	2011	2016
Did not reach benchmarks (Below 400)	75.6%	77.9%
Low Benchmark (From 400 to below 475)	14.1%	14.5%
Intermediate Benchmark (From 475 to below 550)	7.1%	5.6%
High Benchmark (From 550 to Below 625)	2.7%	1.7%
Advanced Benchmark (At or Above 625)	0.5%	0.2%

The above table and Figure 6.5 reveal that in 2016, fewer learners overall were able to attain the benchmarks. The trend indicates a greater proportion of learners not reaching the international benchmarks. In 2016 only 22% reached the international benchmarks compared to 24% in 2011 as the increase in the percentage of learners not reaching the benchmarks in 2016 indicates. The percentages of learners reaching the highest three benchmarks is also lower. Of great concern is the drop at the top – Advanced and High Benchmarks.

In Table 6.5, the percentages of learners who reached the benchmarks are shown per language for the 2011 and 2016 cycles. As shown in Table 6.5, a greater percentage of learners in five languages was able to attain the international benchmarks in 2016 when compared to 2011. Languages that showed improvement in their attainment of the benchmarks include isiNdebele, Sepedi, Sesotho, Setswana, Tshivenda and Xitsonga (varying from 5-10%). While these African languages still have very high percentages of learners not reaching the lowest

benchmarks, improvements have been noted since the last round of participation. However, Afrikaans, English and isiXhosa results reflect lower percentages of learners reaching the benchmarks (-8, -9 and -3 respectively) when 2016 is compared to 2011.

Table 6.5: Discrete percentages of Learners per Language attained the International Benchmarks for 2011 and 2016

	Year	Did not reach benchmark	Low Benchmark	Intermediate Benchmark	High Benchmark	Advanced Benchmark
Afrikaans	2011	48.0%	26.2%	18.4%	6.5%	1.0%
	2016	55.9%	24.0%	14.9%	4.8%	0.3%
English	2011	47.6%	23.5%	19.1%	8.3%	1.6%
	2016	56.9%	22.3%	14.8%	5.2%	0.8%
isiNdebele	2011	91.0%	8.5%	0.5%	0.0%	0.0%
	2016	86.5%	12.7%	0.7%	0.0%	0.0%
isiXhosa	2011	85.1%	13.6%	1.2%	0.1%	0.0%
	2016	88.2%	10.1%	1.6%	0.0%	0.0%
isiZulu	2011	86.7%	10.9%	2.1%	0.3%	0.0%
	2016	86.9%	11.9%	1.1%	0.1%	0.0%
Sepedi	2011	98.2%	1.8%	0.0%	0.0%	0.0%
	2016	93.3%	6.2%	0.4%	0.0%	0.0%
Sesotho	2011	92.7%	6.6%	0.7%	0.0%	0.0%
	2016	82.4%	15.0%	2.6%	0.0%	0.0%
Setswana	2011	93.8%	5.8%	0.4%	0.0%	0.0%
	2016	89.8%	9.3%	0.9%	0.1%	0.0%
siSwati	2011	85.9%	12.9%	1.1%	0.1%	0.0%
	2016	83.6%	14.4%	2.0%	0.0%	0.0%
Tshivenda	2011	97.0%	2.9%	0.1%	0.0%	0.0%
	2016	89.4%	9.1%	1.5%	0.1%	0.0%
Xitsonga	2011	95.4%	4.4%	0.3%	0.0%	0.0%
	2016	87.8%	10.6%	1.5%	0.1%	0.0%

To improve benchmark performance in the African languages, special attention should be given to understanding how to teach basic literacy skills in African languages as well as the strategies teachers use. Euro-centric approaches may not be suitable for languages where syntactic structure differ greatly. Dialects are also an issue, one that should be investigated and addressed.

6.4 PIRLS Grade 4 Trends for Afrikaans and English: 2006, 2011 & 2016

Two languages, Afrikaans and English, have comparable data from all three cycles (see Chapter 3) and as a result, it is possible to compare the 2006, 2011 and 2016 results of the Grade 4 participation. In Figure 6.6, the average mean achievement score is shown for both Afrikaans and English per round of participation.

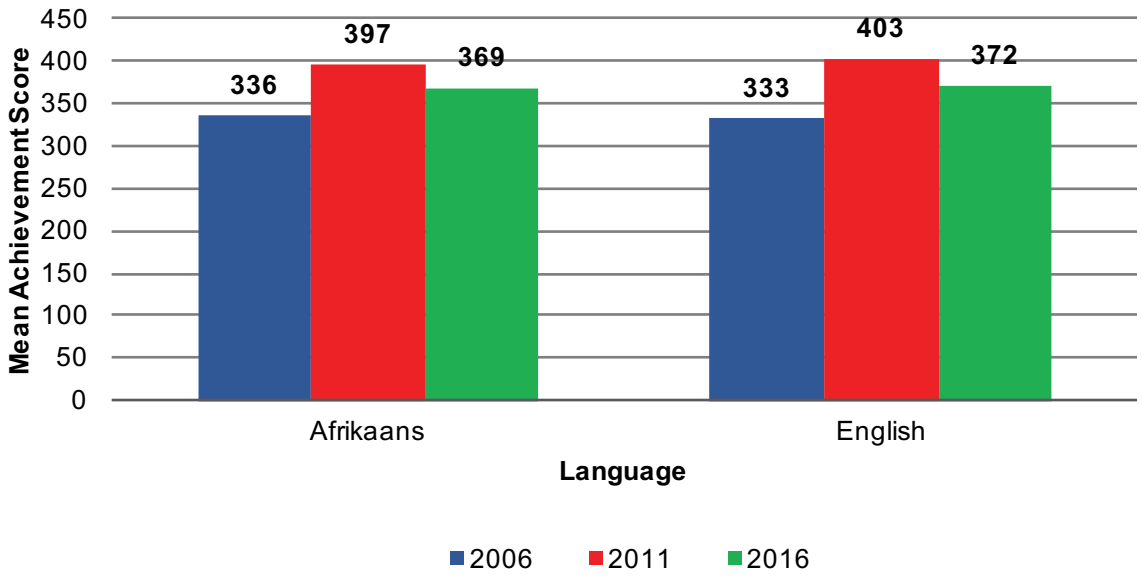


Figure 6.6: Average Mean Achievement for Grade 4 Learners writing in Afrikaans and English in 2006, 2011, 2016

The Grade 4 trends are presented for PIRLS 2006, prePIRLS 2011 and PIRLS Literacy 2016, in Figure 6.6 for Afrikaans and English. Overall there is no significant difference in achievement for learners writing in Afrikaans over 10 years (see Table 6.6). This is despite a gain between 2006 and 2011 where learners performed significantly higher in 2011 (397 points) when compared to 2006 (336 points). However, there is no statistically significant difference between the achievement in 2011 (397 points) and 2016 (369 points).

Table 6.6: Differences Between Afrikaans Grade 4 PIRLS 2006, prePIRLS 2011 and PIRLS Literacy 2016

	Year	Mean	SE	2006	2011	2016
Afrikaans	**2006**	336	17.6		▼	●
	2011	397	11.6	▲		●
	2016	369	13.4	●	●	

▲ Significant increase ▼ Significant decrease ● No significant difference

In Table 6.7, the results for the learners writing in English are shown for the different rounds of participation. For English, there is no significant difference in achievement over the past decade between 2006 and 2016, despite the 2011 results being significantly higher than 2006. The 2011 (403 points) is significantly higher when compared to 2006 (333 points). However, there is no statistically significant difference between performance in 2011 (403 points) and 2016 (372 points).

Table 6.7: Differences Between English Grade 4 PIRLS 2006, prePIRLS 2011 and PIRLS Literacy 2016

	Year	Mean	SE	2006	2011	2016
English	**2006**	333	17.5		▼	●
	2011	403	11.6	▲		●
	2016	372	14.4	●	●	

▲ Significant increase ▼ Significant decrease ● No significant difference

In Table 6.8, the combined average scores for Afrikaans and English achievement are shown across the three cycles of participation.

Table 6.8 Grade 4 Afr/Eng Combined Mean Achievement Score in three cycles of participation

	Year	Mean	SE	2006	2011	2016
Afr/Eng (Grade 4)	**2006**	334	12.2		▼	▼
	2011	401	9.1	▲		▲
	2016	371	11.4	▲	▼	

▲ Significantly higher than ▼ Significantly lower than

The combined averages of the two languages in 2016 (371 score points) and 2011 (401 score points) is significantly higher than the averages of 2006 (334). The 2016 performance was significantly lower than the 2011 performance when the two languages are combined. Figure 6.7 shows the pattern of the combined scores visually.

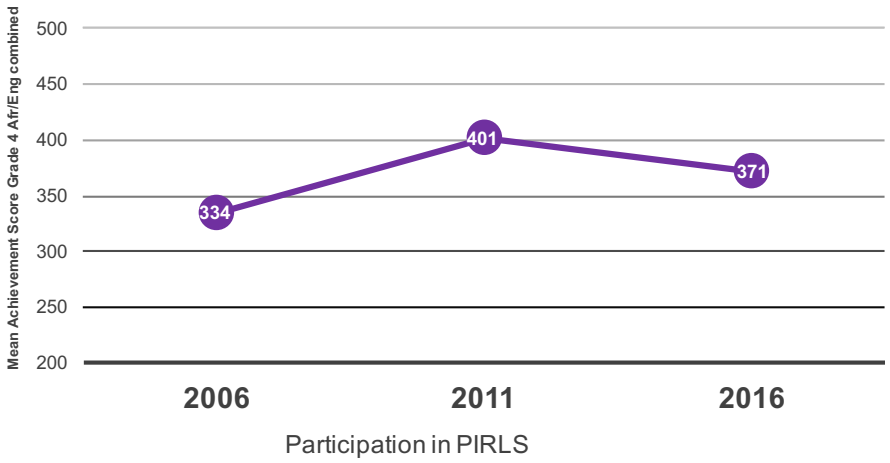


Figure 6.7: Eng/Afr Combined Scores for Grade 4 in three cycles of PIRLS participation

The combined scores for Afrikaans and English were analysed as the two languages are closer in performance than the other languages and data are available across the three cycles. However, both languages have large Standard Errors, indicating potential heterogeneous groups within the test taking population. Further analysis is recommended to gain insight into the changes taking place within the languages.

The learners writing in Afrikaans and English performed similarly to each other in 2006, 2011 and 2016. No statistically significant difference was found between these two groups for any cycle. In Figure 6.8 the benchmarks reached per cycle is shown for Afrikaans and English. For both Afrikaans and English language of test, the 2006 groups had the highest percentages of learners not reaching the Lowest Benchmark (about 63%). The 2011 group had more learners reaching the benchmarks, but in the 2016 cycle the percentage of learners reaching benchmarks declined again.

The Afrikaans 2016 group had 0.2% who reached the Advanced Benchmark, but this cannot be depicted on the graph.

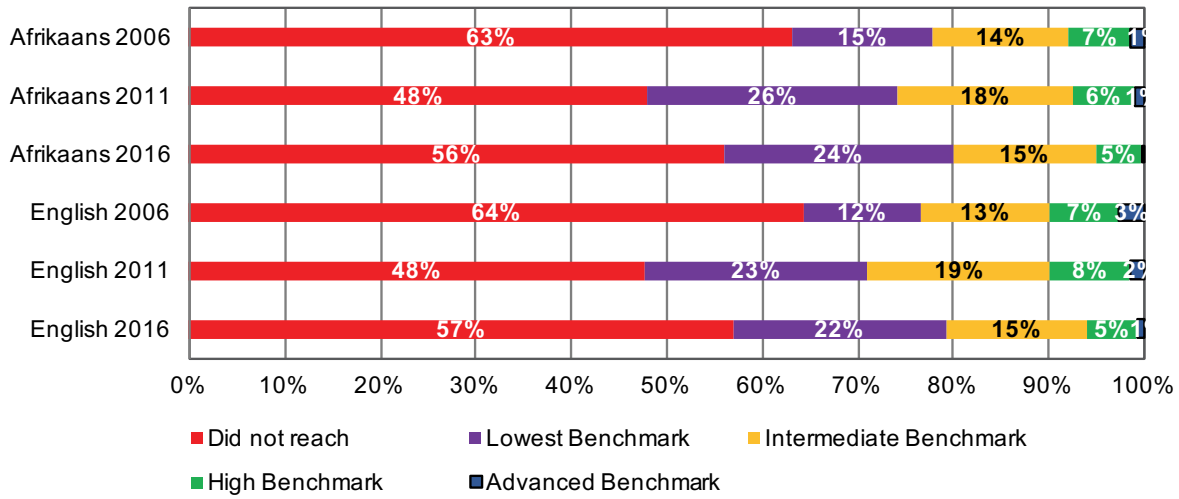


Figure 6.8: Benchmarks Achievement for Grade 4 Learners writing in Afrikaans and English in 2006, 2011, 2016

To better understand the changes taking place within the Afrikaans and English schools, further research and analyses are needed. Both groups have large Standard Errors, indicating a lot of variation within the scores. Sub-populations within the language groups should be examined to identify the groups which require interventions. Bottom and top performing groups may require different interventions and both should be assisted.

6.5 Conclusion

When taking a broad view of the South African achievement trends, the analysis revealed that there is no significant difference in performance between the 2011 and 2016 cycles of participation for Grade 4s in PIRLS Literacy. However, when sub-populations were examined, it was found that five African languages registered a statistically significant improvement in 2016 compared to 2011. This was noteworthy as these were the African languages at the lowest end of the scale. Of concern, however, is that overall African languages still have significantly lower reading literacy achievement when compared to Afrikaans and English. Furthermore, the lack of improvement over 10 years in the reading achievement for Afrikaans and English is cause for concern. Girls performed significantly better than boys in both 2011 and 2016. In 2016, fewer learners were able to attain the international benchmarks when compared to 2011. In addition, there is a drop at the top in the percentage of learners reaching the highest benchmarks which is concerning. However, an analysis by language, revealed that six African languages (isiNdebele, Sepedi, Sesotho, Setswana, Tshivenda and Xitsonga) showed an increased percentage of learners who could reach the Lowest Benchmark. The overall benchmark attainment for these six African languages remains low, despite improvements. However, for the Afrikaans, English and isiXhosa groups, lower percentages of learners attained the benchmarks in 2016 when compared to 2011.

There is an improvement for some groups, such as the five African languages in the overall mean scores, and six of the African languages where higher percentage attained the benchmarks. However, the overall reading literacy achievement for South Africa remains very low (see Chapter 4) and relatively few learners could achieve the Lowest Benchmark (basic literacy) in both rounds of participation, despite writing an easier version of the test (PIRLS Literacy).

CHAPTER 7: GRADE 4 PIRLS LITERACY 2016 THE SCHOOL ENVIRONMENT AND CLIMATE

Karen Roux and Sarah Howie

7.1 Introduction

The general schooling environment in South Africa during the conducting of PIRLS Literacy 2016, at the end of 2015 and the beginning of 2016, is described in this chapter. The term 'school climate' is an umbrella term used to portray the school environment, which includes several aspects such as school composition, school resources and facilities, school emphasis on academic success, principal leadership activities, school discipline and safety. In educational effectiveness research, both nationally and internationally, a conducive school climate is seen as one of the foremost explanatory factors in explaining learner educational attainment (see Reynolds, Lee, Turner, Bromhead, & Subasic, 2017; MacNeil, Prater, & Busch, 2009).

The theme school environment is separated into two sections: School Composition and Resources (7.2) and School Climate (7.3). The former will explore school emphasis on school composition and location as well as school facilities, resources and technology. The following section will look at academic success and school order, safety and discipline.

In order to understand South African learner achievement during PIRLS Literacy 2016, this chapter highlights some key indicators and describes the broader learning environment of participating learners. It should be noted that this chapter refers to the *School Questionnaire*, completed by the school principal, unless otherwise stated.

7.2 School Composition and Resources

The school environment may be a positive influence on learner academic success as it affects teacher and learner attitudes about teaching and learning. However, the relationship between school resources and learner achievement has been deemed complicated (Mullis, Martin, Foy & Drucker, 2012). In this section, the profile (7.2.1) of the tested schools is described followed by the facilities and resources (7.2.2).

7.2.1 Profile of South African Schools and Grade 4 Learners

The PIRLS Literacy *School Questionnaire*, completed by the school principals, sought information about the school location, school composition in terms of socio-economic background and language of the test as home language, as well as the language proficiency levels of learners entering primary school.

7.2.1.1 School Location

The location of the schools appears to be important, as was found in previous PIRLS studies, in that it has an effect on learner achievement (see Howie et al., 2008 and Howie et al., 2012). This was also found to be the case in PIRLS Literacy 2016 (see Chapter 4). The school location of Grade 4 PIRLS Literacy learners is presented in Table 7.1.

Table 7.1: School Location of South African Schools participating in PIRLS Literacy 2016

School Location	% of learners	SE of %
Urban– densely populated	11	2.3
Suburban– on fringe or outskirts of urban area	9	2.0
Township near urban area	18	2.7
Medium size city or large	3	1.3
Small town or village	20	2.6
Remote rural	39	3.6

As reported by school principals, a larger percentage (39%) of Grade 4 learners attended schools in remote rural areas compared to other areas. This occurrence could be due to sampling procedures followed (see Chapter 3 for more detail about sampling). As discussed in Chapter 4, learners attending schools in remote rural areas (291, SE=4.9) performed considerably lower than their peers in other areas.

The differences found by language may also be conflated by a number of other factors. The national sample revealed a strong rural element (see Table 7.1) with more than a third of the learners tested at schools in rural areas which had been previously found to have an effect on the PIRLS 2011 performance (Howie, 2015).

The PIRLS Literacy 2016 results concur with the previous findings (Howie et al., 2012) and indicate that the learners in the remote rural settings achieve significantly below (291, SE=4.9) the learners from urban areas who achieved between 384-417 points. Learners in township areas also tended to achieve low scores, only 20 points higher than learners in remote areas and more than 100 points below the highest performing group.

Table 7.2 South African Grade 4 Learner Achievement by Location

Location	Mean	SE	Urban–Densely populated	Suburban	Township near urban area	Medium size city or large town	Small town or village	Remote rural
Urban–Densely populated	384	17.2		●	▲	●	▲	▲
Suburban	393	25.9	●		▲	●	▲	▲
Township near urban area	312	8.2	▼	▼		▼	●	▲
Medium size city or large town	417	29.2	●	●	▲		▲	▲
Small town or village	302	6.2	▼	▼	●	▼		●
Remote rural	291	4.9	▼	▼	▼	▼	●	

▲ Significantly higher than ▼ Significantly lower than ● Not significantly different
Significance level < 0.05

School funding in South Africa is allocated according to a poverty index, known as the quintile system. Based on the perceived poverty of the area in which the school is located, schools are allocated a quintile classification. Quintiles 1, 2 and 3 are the most impoverished and receive larger government funding and are non-fee paying schools. Whereas Quintiles 4 and 5 are considered to be located in more privileged areas, receive less funding but are fee-paying schools. Even though this sample was not specifically selected based on quintiles, it is reported as it has equity implications. Most of the schools in the sample were classified as Quintile 1 schools, the most impoverished. Only 12% of schools were in the Quintile 5 category, the schools in areas which are classified as being more affluent (see Chapter 4 and 9).

Whilst the sample was not stratified by the variable "quintile", the results per quintile are tentatively presented (see Table 7.3). The majority of the learners assessed were from Quintiles 1-3 which fits the national schooling population. These quintiles would also comprise mainly learners tested in African languages.

Table 7.3 South African Grade 4 Learner Achievement in PIRLS Literacy 2016 by Quintile

Quintile	Percentage of learners	SE %	Mean Achievement Score	SE
Quintile 1	27	2.9	288	5.3
Quintile 2	18	2.4	299	7.6
Quintile 3	22	2.7	303	7.5
Quintile 4	19	3.0	328	8.6
Quintile 5	12	2.1	426	16.1

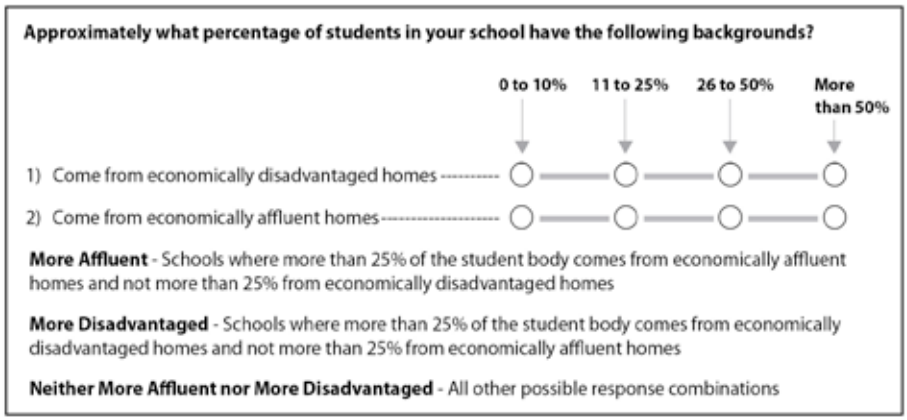
Note: Independent schools are excluded from results, they are a very small percentage (3%) of schools and do not have a quintile classification

The smallest and highest performing group was from Quintile 5 which is consistent with other data and comprised learners mostly tested in Afrikaans and English, although the home languages varied considerably. Learners from Quintile 5 achieved significantly higher results than those from all other quintiles and almost 100 points more than learners in Quintile 4 and almost 140 points more than those in Quintile 1. No significant differences were found between learners in Quintiles 1-3.

7.2.1.2 School Composition by Student Economic Background

South Africa's economic background is of importance to educational research as it has been found to have an association with learner achievement (see Visser, Juan & Feza, 2015; Bayat, Louw & Rena, 2014). Internationally, the Coleman Report (Coleman et al., 1966) first highlighted the importance of compositional characteristics of a school's learner population and how these characteristics tend to affect academic achievement.

School principals were asked to indicate the percentage of learners in their schools who come from economically disadvantaged homes or economically affluent homes. The question comprised four categories as indicated in the following Information Box:



Information Box 1: School Composition by Learner Economic Background

The PIRLS Literacy study found that 75% of learners come from disadvantaged backgrounds (see Figure 7.1).

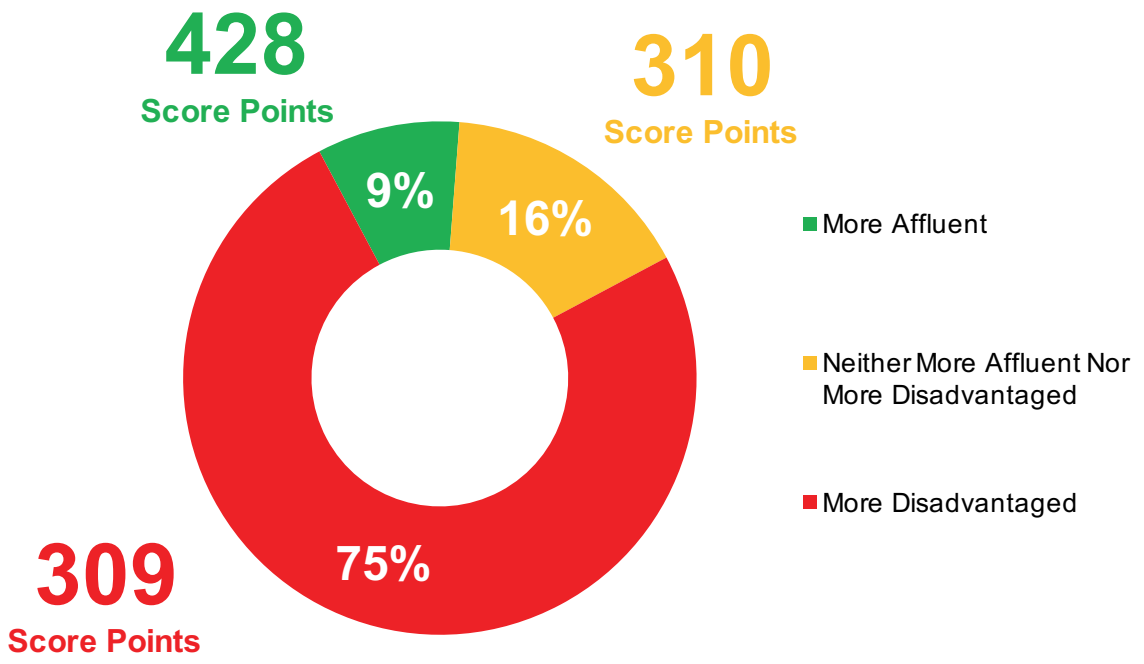


Figure 7.1: South African School Composition by Learner Economic Background and Grade 4 Learner Achievement

Learners from *More Disadvantaged* communities achieved a reading literacy score of 309 (SE=4.8) whereas learners from *More Affluent* communities reached 428 (SE=23.1). There is a 119-point difference between the two aforementioned categories.

7.2.1.3 Schools with Learners having the Language of Test (LoT) as Home Language

In previous cycles of PIRLS, it was found that in most languages learners achieved a higher mean score if the test language was the same as the language the learner spoke at home (see Howie et al., 2012). Principals were asked to categorise the composition of their schools in terms of the proportion of learners learning in a language which is different to their home

language. Options given to principals included *More Than 90%, 51-90%, 50% or Less* of learners who had the language of the test as their home language.

Internationally, school principals reported that 63% of Grade 4 learners were in schools where most learners (more than 90%) spoke the language of the test as their home language. Nationally, school principals reported that almost two-thirds (59%) of South African Grade 4 learners were in schools where most (more than 90%) of the learners spoke the language of the test as their home language. Figure 7.2 displays the percentage of South African Grade 4 learners that spoke the language of the test as their home language.

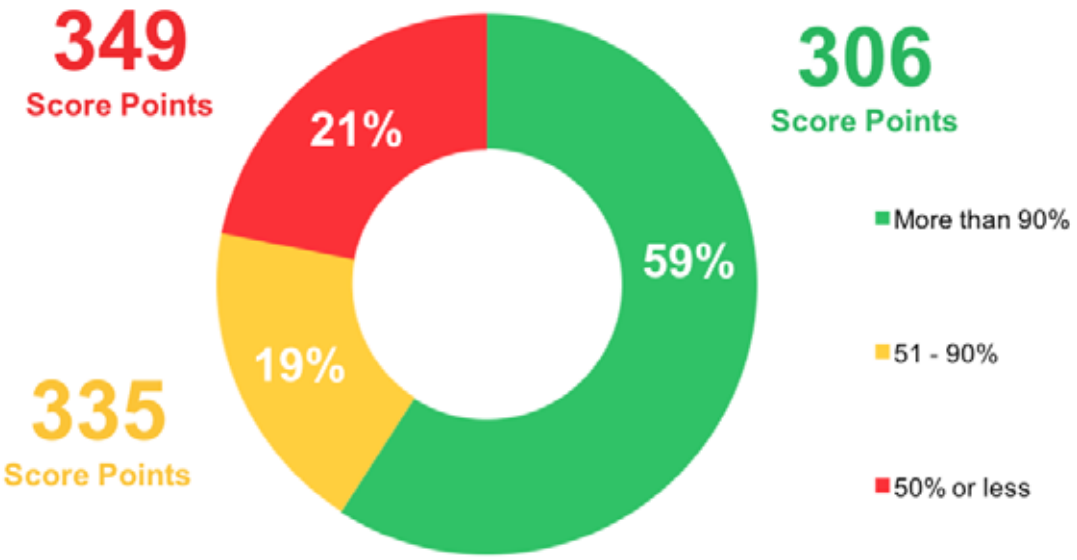
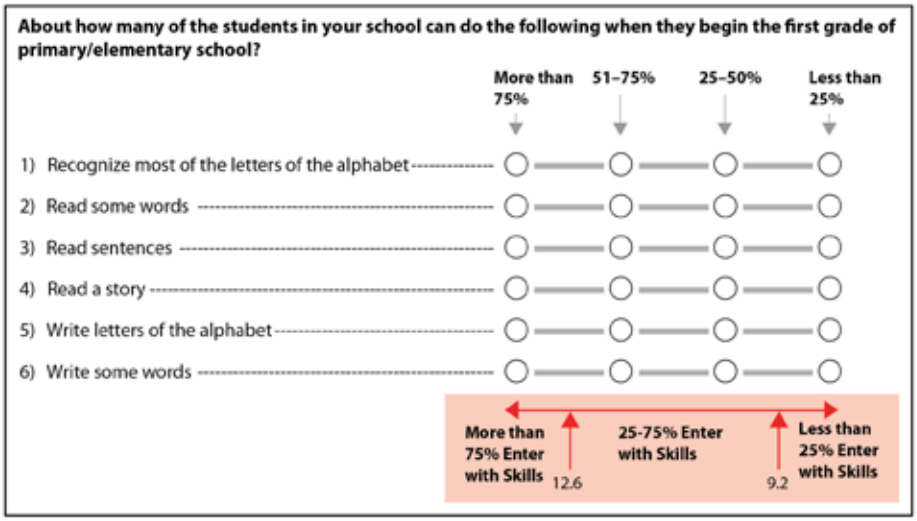


Figure 7.2: Grade 4 Learners Test Language the same as their Home Language and Learner Achievement

Contrary to the international findings, overall in South Africa, the group of learners that achieved the lowest average score of 306 (SE=4.5) were in schools where most of the learners spoke the test language as the home language spoken at home. The highest performing group of South African Grade 4 learners attended schools where fewer than 50% spoke the test language as their home language (349, SE=12.3).

7.2.1.4 Schools where Learners enter the Primary Grades with Early Literacy

One of the most important factors influencing reading achievement is learner school readiness when entering school at Grade 1 (see Chapter 9 for more information about preschool and preschool attendance). The PIRLS Literacy *School Questionnaire* asked the school principals about learner proficiency of each of the six early literacy skills when entering schools. Information Box 2 presents how the scale was created:



Information Box 2: Schools Where Learners enter Primary School with Literacy Skills Scale

Figure 7.3 shows the percentage of learners, as categorised by the school principal that enter school with early literacy skills and the figure also includes learner achievement scores associated with each category of learner.

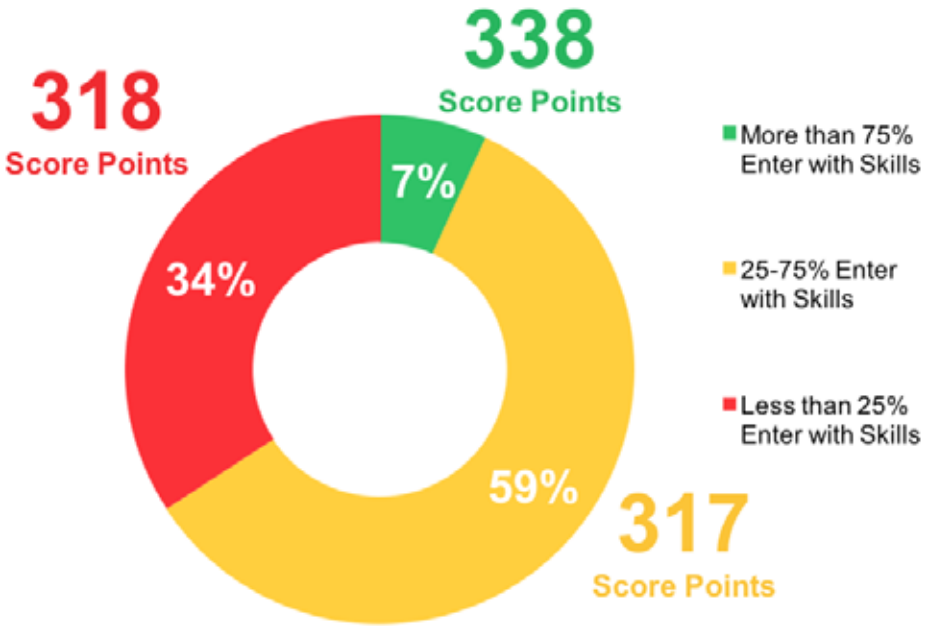


Figure 7.3: Grade 4 Learners who enter Primary School with Early Literacy Skills and Learner Achievement

Internationally, principals reported that about one-fifth (22%) of learners are in schools that have more than 75% of Grade 4 learners who entered school with literacy skills. These learners achieved the highest reading score of 516 (SE=1.6). This contrasts with South African schools where only seven percent are in schools where the majority of learners (more than 75%) enter with early literacy skills. This group is also the highest performing group of learners (338, SE= 34.2[20]). If learners entered

[20] The Standard Emor (SE) is large and seems to have much vaiation within the category.

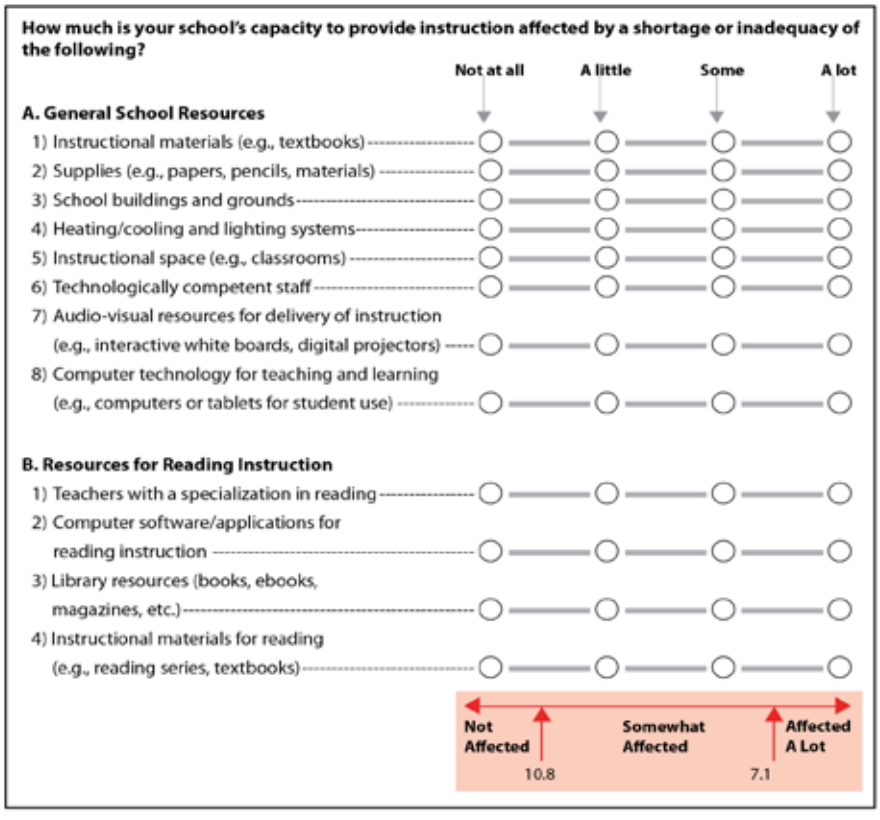
school with more than one-quarter or less than a quarter having early literacy skills, very little or no difference in the achievement scores of the other two groups of learners is evident.

7.2.2 School Facilities and Resources

Instructional materials and resources are crucial for teaching and learning, especially in developing countries where there is a scarcity of teaching resources or in some cases, where schools do not even have adequate school structures. The focus in the PIRLS Literacy *School Questionnaires* was on facilities, the school library and computers available for teaching. This section describes the availability of school and educational resources, the extent to which the school was affected by shortages of the resources and the relationship with South African learner achievement in Grade 4.

7.2.2.1 Instruction affected by Reading Resource Shortages

An important factor for teaching and learning is the extent to which shortages of school resources affect learner achievement. The PIRLS Literacy *School Questionnaire* asked school principals about the extent of shortages in their school as well as about resources that are specifically aimed at supporting reading instruction; for example, the number of library books available. Principals were asked specifically about 12 school and classroom resources, which included very basic items such as lighting, heating and cooling facilities, instructional space, staff, instructional materials, library materials and about information and communications technology. Information Box 3 indicates the items used to create the scale.



Information Box 3: Instruction affected by Reading Resource Shortages Scale

Figure 7.4 shows the percentage of schooling affected by resource shortages in Grade 4 classes and the associated learner reading achievement score.

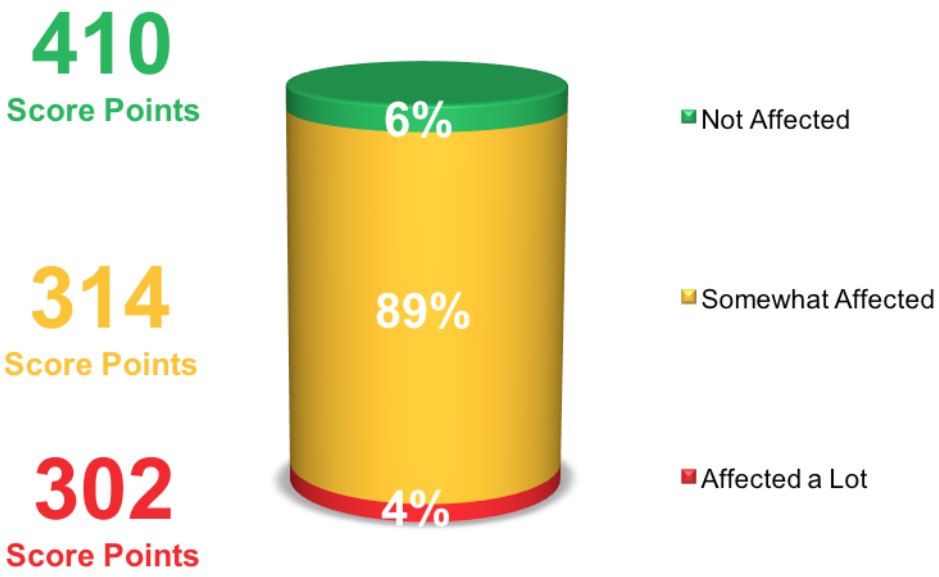


Figure 7.4: Grade 4 Learner Instruction affected by Resource Shortages and Learner Achievement

Internationally 31% reported that they were *Not Affected* by resource shortages in contrast to only six percent of South African schools. The majority (89%) of South African schools reported that the shortages affect their instruction to some extent and four percent indicated that it *Affected a Lot*.

Internationally, learners attending schools *Not Affected* by resource shortages achieved the highest average reading achievement (521, SE=1.4). There appears to be a relationship both internationally and nationally between resources and performance. South African schools *Not Affected* had the highest learner achievement score of 410 (SE=24.4) compared to schools with some resource shortages where the achievement score fell almost 100 points to 314 (SE=4.4).

7.2.2.2 Teacher Working Conditions

In some countries, it has emerged that teacher shortages may be a result of poor working conditions. The PIRLS Literacy *Teacher Questionnaire* asked teachers about their working conditions, with a specific focus on the school building, workspace and resources. Just over three-quarters (76%) of the teachers indicated that they have *Minor to Moderate Problems* with their working conditions (see Figure 7.5) and these conditions seem to correlate with achievement.

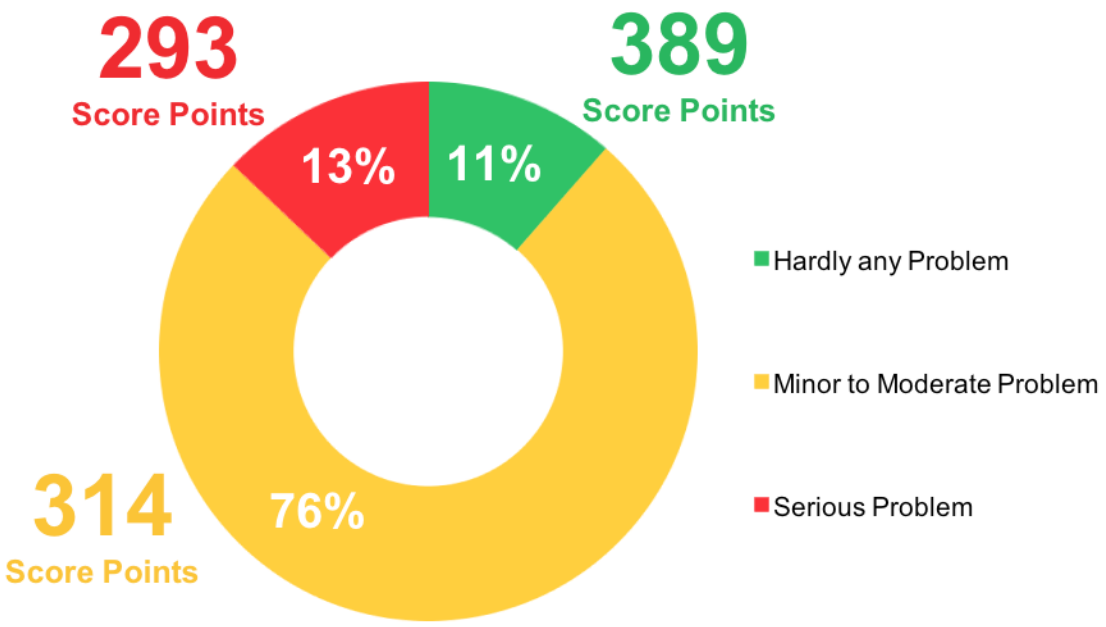


Figure 7.5: Teacher Working Conditions and Grade 4 Learner Achievement

South African learner achievement scores on the PIRLS Literacy study seem to vary considerably when associated with teacher working conditions. Learners taught by teachers reporting *Serious Problems* had the lowest performance (293, SE=8.9), which was substantially lower than those whose teachers reported better working conditions (389, SE=21.4).

7.2.2.3 Existence of a School Library and Size of the School Library

Libraries are regarded internationally as an essential educational resource at schools and for society in general. Research indicates that school libraries with appropriate staffing, adequate funding, and a rich collection of materials in a variety of formats impacts positively on literacy as well as on overall academic achievement (see California Department of Education, 2017).

In many parts of the world, libraries have increasingly been equipped with technology to become media centres that offer not only hard copy resources such as books and posters but also Internet connection, online books, magazines and journals, interactive boards and more. Even though fully-equipped libraries (both hard copy and electronic) are to be found, they are in limited numbers particularly in rural schools and within rural communities in South Africa. According to the principals, most (62%) schools do not have a school library (see Figure 7.6). A similar situation was reported in both 2006 and 2011, with little improvement being seen over the past decade. In contrast, internationally only 13% of learners attended schools with no library. Only Morocco reported having as many learners as South Africa, without access to school libraries internationally.

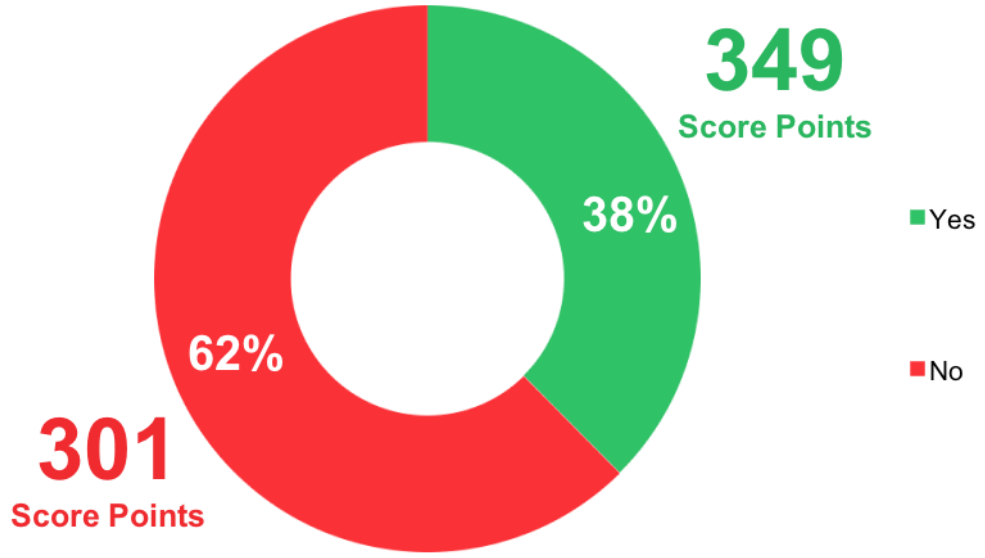


Figure 7.6: Grade 4 Learners in Schools with Libraries and Learner Achievement

In addition to having a space dedicated to books, the quantity and quality of the materials are important including the variety, age and numbers of books. PIRLS 2016 restricted questions to those of the quantity of the books and asked principals to categorise the number of books approximately.

Table 7.4 shows that of the schools that have an established library, only 16% of Grade 4 learners attended a school with libraries with *More Than 5 000 Book Titles* compared to 32% internationally. In South Africa, it appears that just over half (52%) of learners are in schools that have libraries have *500 or Fewer Book Titles* compared to 15% internationally.

Table 7.4 School Library Books Available and Learner Achievement

	% of Learners	SE of %	Mean Score	SE
More than 5 000 Book Titles	16	5.2	393	32.6
501-5 000 Book Titles	31	6.1	375	17.0
500 Book Titles or Fewer	52	6.6	320	11.8

There appears to be a positive relationship between school library and learner achievement. Table 7.4 shows that a positive difference in learner achievement emerges when schools have libraries and libraries are equipped with a variety and number of books. Learners who attended schools where there are *More Than 5 000 Book Titles*, achieved 393 points (SE=32.6) whereas learners who attend schools with a small library of *500 Or Fewer Books Titles* achieved a lower 320 (SE=11.8). Those learners in schools with no library, however, achieved only 301 points (SE=5.1), almost 100 points below learners in schools with libraries that were better resourced. Internationally, the difference was also considerable at 31 points.

7.2.2.4 Schools with Computers available for Instruction

The advent of the Fourth Industrial Revolution (World Economic Forum, 2017) has significant consequences for education in preparing learners to participate effectively in a technologically-

driven and innovative society. Electronic resources are seen as an emergent factor in literacy learning (see Kamil, Intrator & Kim, 2000) and information and communications technology (ICT) is increasingly used globally for modern teaching and learning. PIRLS 2016 included a number of questions regarding the availability of ICT and its utilisation in schools and classrooms as well as in home environments. Internationally, the relationship between the utilisation of ICT in education and achievement in large-scale assessments has been not been definitively ascertained, with earlier results indicating negative effects (Pelgrum & Plomp, 2002).

Principals were asked about the ratio of learners: computers available for instruction (Figure 7.7).

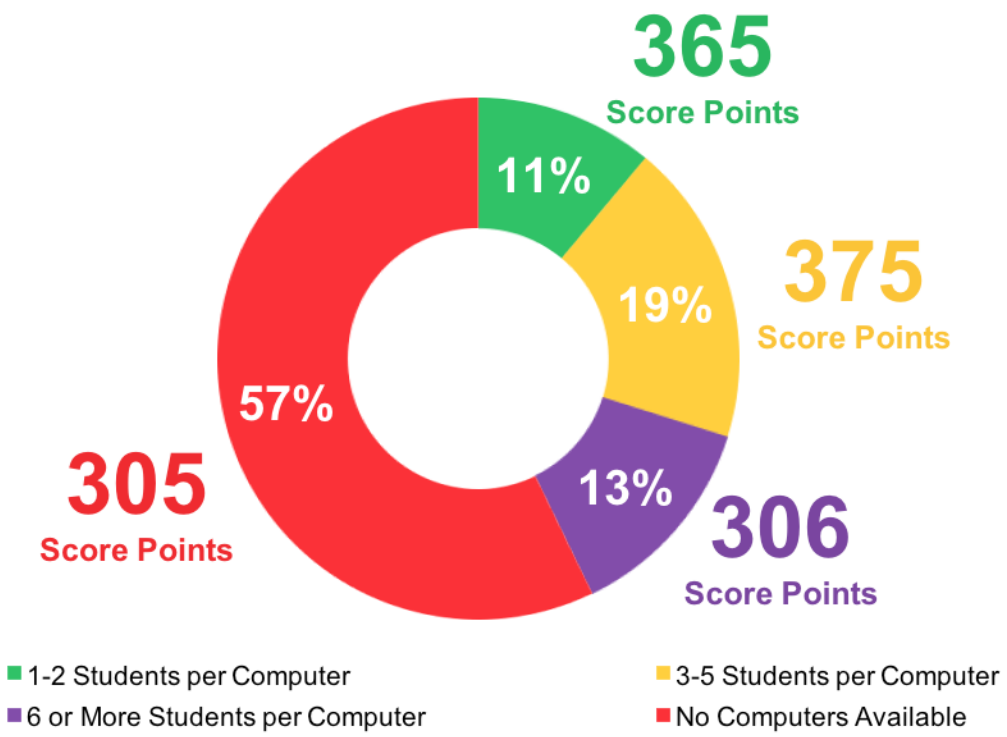


Figure 7.7: Learners with Computers available for Instruction and Grade 4 Achievement

More than half (57%) of the learners attend schools where school principals reported that no computers are available for use by learners. This percentage compares to seven percent of learners internationally.

Generally, learners in schools with access to school computers have higher achievement scores than those who do not, although there is substantial variance in the scores within different categories[21]. South African Grade 4 learners achieved mean scores of 365 (SE=28.7) when they have at least one computer available for one to two learners compared to schools with *No Computers Available* (305, SE=6.0). Internationally a substantial difference was also found although with 37 points (514 compared to 477 points).

[21] The standard errors are very large for the category 1-2 students per computer implying that even where computers with this ratio are available, the achievement of the learners may vary 57.4 points above or below the mean score. This was different to every other country in the study.

7.3 School Climate

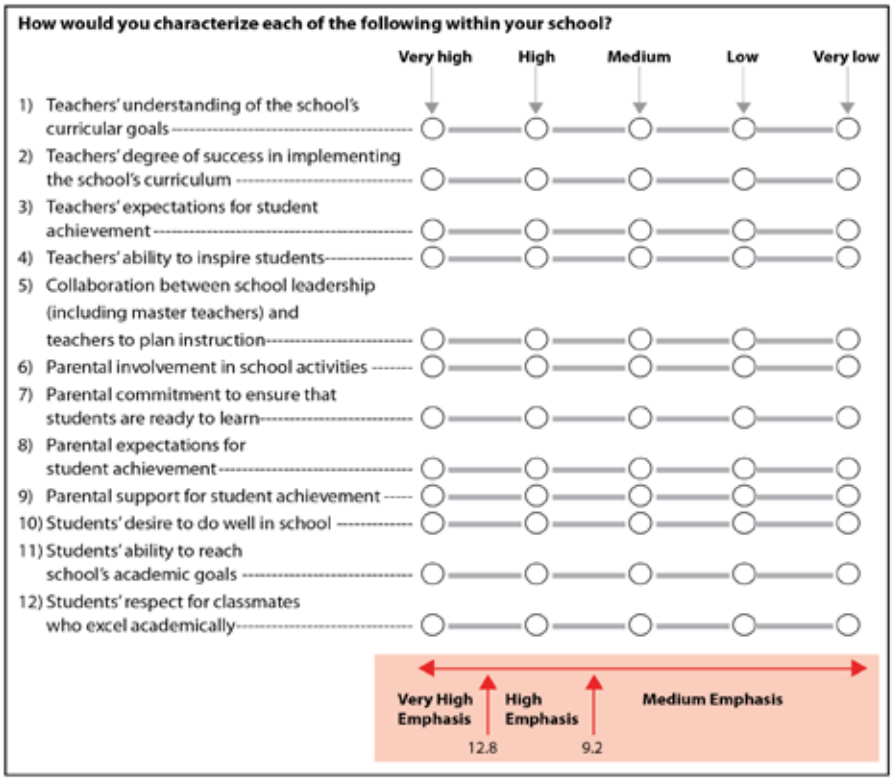
It is commonly known that a positive school climate is linked to higher educational achievement (see Brand, Felner, Shim, Seitsinger & Duman, 2003). Previous cycles of PIRLS found that learners with higher reading achievement usually attend schools that "emphasize academic success through rigorous curriculum goals, effective teachers and students that desire to do well, and parental support" (Mullis et al., 2012, p.161). Schools with a poor school climate, particularly those with discipline problems and concern about safety, may find that learner performance and achievement is affected.

7.3.1 Schools Emphasis on Academic Success

Various studies have shown a strong relationship between positive school environments, which emphasise academic success, and learner achievement (Combrinck, Van Staden & Roux, 2014). Some studies have also found that in particular situations, a school that emphasises academic success can overcome socio-economic disadvantages (see McGuigan & Hoy, 2006).

7.3.1.1 Emphasis on Academic Success

The *School Questionnaire* asked the principals how they would characterise some academic success aspects such as the teacher understanding of school curricular goals and parental involvement in school activities. Information Box 4 shows how the scale was created.



Information Box 4: School Emphasis on Academic Success Scale

Figure 7.8 presents the percentage of learners in schools where the school principals indicated the levels of emphasis on academic success as well as the Grade 4 learner reading achievement score.

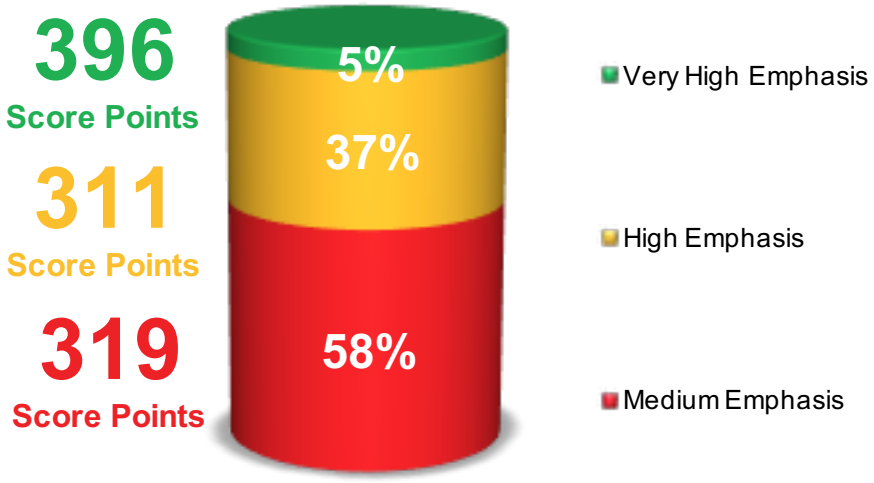


Figure 7.8: School Emphasis on Academic Success and Grade 4 Learner Achievement

Internationally, eight percent of Grade 4 learners attended schools where the principals reported a *Very High Emphasis* on academic success. South African school principals reported similarly at five percent. Interestingly, more than half of South African learners (58%) attended schools with a lower emphasis *(Medium)* on academic success. Schools where the emphasis was very high achieved higher average reading achievement (396, SE=26.6)[22] in contrast to those with Medium emphasis who achieved over 70 points less (319, SE=6.0).

Teachers were also asked to rate their school in terms of its emphasis on academic success. Whilst internationally, the reports for all countries are "nearly identical" (Mullis & Martin, 2017, p.149), this is not the case in South Africa. According to teachers, 15% of learners attend schools with a *Very High Emphasis* with only 43% attending schools where the emphasis is lower *(Medium)*. The association with achievement is not as strong as a result, with learners, whose teachers reported a very high emphasis, only achieving 324 points (compared with 396 points from the principal reports) and 313 points for those with the lowest emphasis on academic success.

The overall scale score between principal reports and teacher reports was considerable and whilst principal rating placed South Africa about halfway amongst 50 countries (9.2 scale score), teachers appeared to rate the emphasis more highly (10.1 scale score), placing South Africa within the top 10 countries in terms of *Very High Emphasis* placed on academic success. Given that most of the top 10 countries rated by teachers were low achieving countries, this is an interesting and perhaps contradictory finding.

[22] The Standard Error (SE) is large and seems to have much variation in this category.

7.3.1.2 Emphasis in Early Grades on Reading Skills and Strategies

School principals were provided with a list of reading skills and strategies assessed in PIRLS Literacy 2016, and were asked to indicate at which grades these reading skills and strategies receive emphasis for at least 50% of the learners. The grade shown in the figure below is the median grade reported by principals. Overall, seven out of the 14 skills and strategies are taught in South Africa at the same grade level as internationally. The remaining skills and strategies (all seven) are taught nationally in later grades than those internationally.

The teaching of reading skills differs internationally and nationally. In particular, the differences are reading connected text which is an emphasis at Grade 2 level nationally but is covered in Grade 1 internationally. *Identifying the Main idea of a text, Explaining or supporting understanding of a text, Comparing a text with personal experience, Making predictions about what will happen next text* in a text are skills emphasised at Grade 3 level in South Africa but are taught at Grade 2 level internationally. *Comparing Different Texts, Making Generalisations and Drawing Inferences* based upon a text are taught at Grade 4 level in South Africa but at Grade 3 level internationally.

An interesting finding is that the top performing country, the Russian Federation, completes all of the skills and strategies in Grades 1-3, whereas most countries are still emphasising at least two of the skills in Grade 4.

The teaching of various reading skills at particular grade-levels is elaborated on below.

Figure 7.9 which shows the overall starting grade where schools emphasise reading skills and strategies.

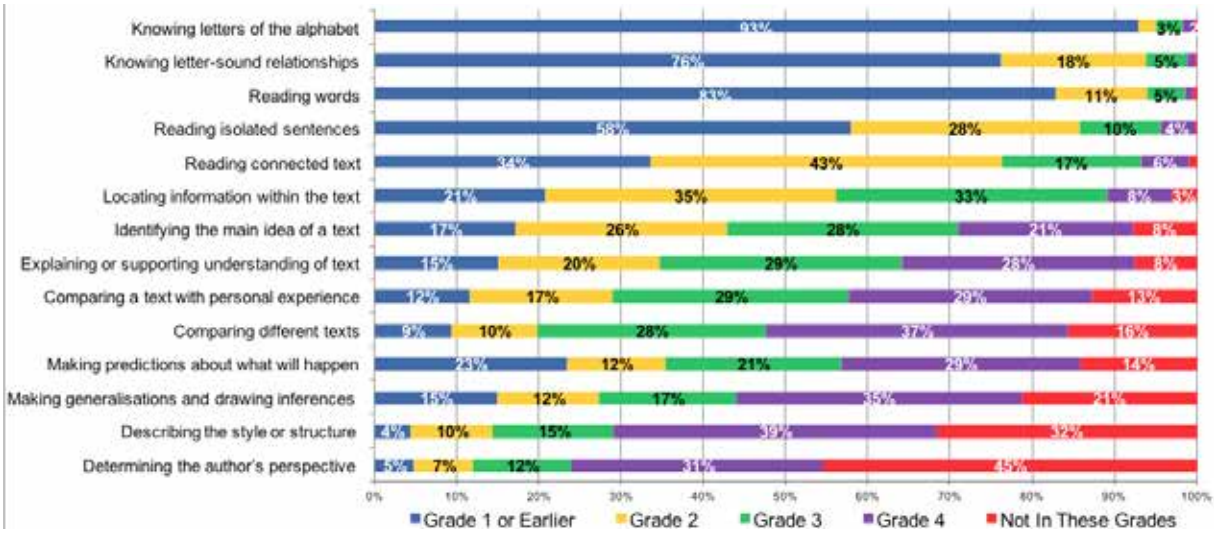


Figure 7.9: Emphasis on Reading Skills and Strategies

It seems that when emphasis is placed on the early teaching of reading skills, the learners achieve higher reading literacy scores. For example, when emphasis is placed on *Knowing Letters of the Alphabet* in Grade 1, learners achieve a reading score of 319 (SE=5.4) compared to if they only began learning this skill in Grade 3 (283, SE=18.0). Another example would be when emphasis is placed on *Making Predictions About What Will Happen Next in the Text* in

Grade 1, the learners achieved an average score of 347 (SE=12.56) in comparison to learners who are exposed to this skill in Grade 4 (300, SE=8.0).[23]

7.3.1.3 Parental Perceptions of their Child's School

The PIRLS Literacy *Parent Questionnaire* asked the parents of Grade 4 learners about their perceptions of their child's school. It appears that most parents, internationally and nationally, reported positive perceptions about their child's school.

Internationally about 65% of learners had parents who were *Very Satisfied* and only 5% who were *Less than Satisfied*. South Africa was within the top five most satisfied group of parents internationally despite being the lowest achieving country out of 50. Interestingly of the top five countries in achievement, only parents in Ireland were *Very Satisfied* (82%), only 65-55% of parents of learners in Hong Kong, Singapore, Russian Federation and Finland were *Very Satisfied* and only in Hong Kong and Singapore did satisfaction appear to be associated with achievement.

Figure 7.10 presents the South African parents' level of satisfaction with their child's school along with the learner reading achievement scores.

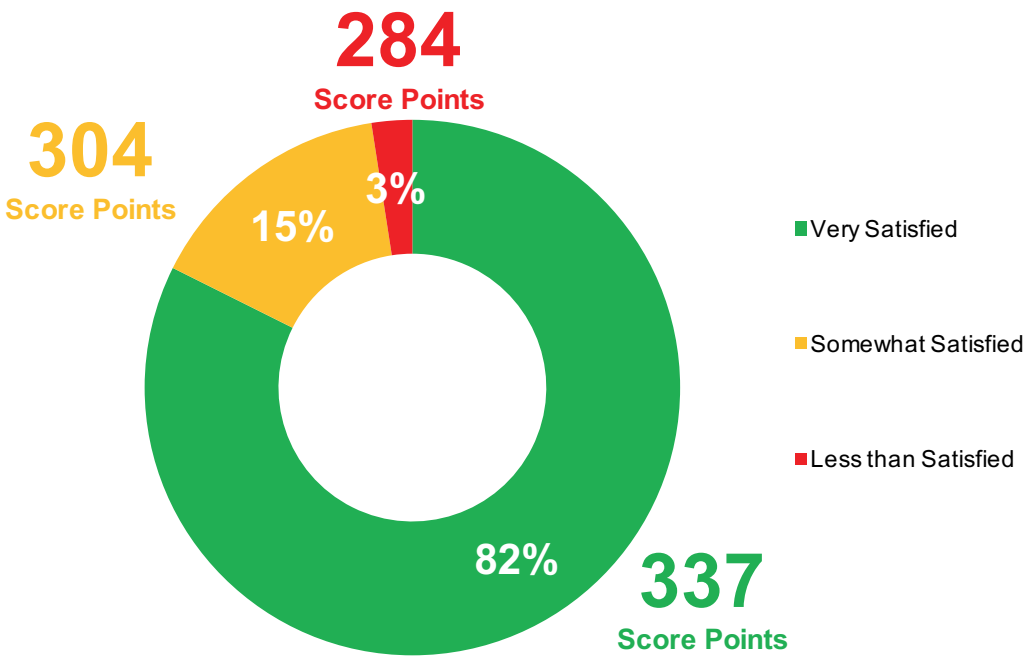


Figure 7.10: Level of Satisfaction with School and Grade 4 Learner Achievement according to parents

Figure 7.10 shows that more than three-quarters (82%) of South African learners' parents indicated that they were *Very Satisfied* and these learners also achieved higher reading achievement (337, SE=5.4) than learners of parents of those who were *Somewhat or Less than Satisfied*.

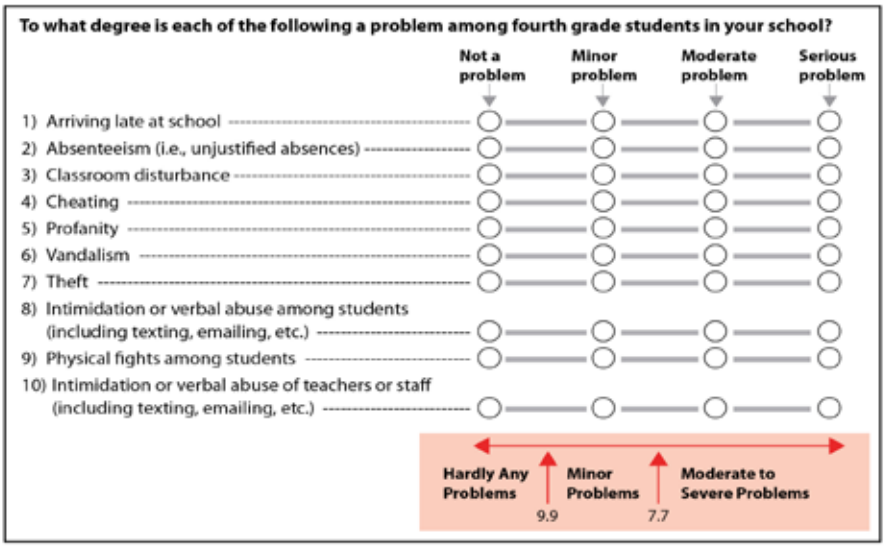
[23] See Appendix C for more information.

7.3.2 Schools with Discipline and Safety Problems

PIRLS 2011 found that schools with problems related to discipline and safety problems were not conducive to high achievement in reading literacy. In addition, learners who attended schools with disorderly environments and more bullying had much lower achievement than their peers in safer and more orderly schools. A sense of security is important for a stable learning environment for staff and learners. In this section, the findings for PIRLS Literacy 2016 are presented on school discipline and safety, safe and orderly school and bullying of learners at school.

7.3.2.1 School Discipline and Safety

Previous cycles of PIRLS have reported principal perceptions on the extent to which discipline, disorderly and bullying behaviours are a problem at their schools. South Africa previously revealed areas of concern and, as school discipline is important in maintaining a safe and orderly environment, it is important to continue to monitor this aspect in schools. School principals were asked to indicate the degree to which discipline, disorderliness and bullying are considered problems in their schools. Information Box 5 shows how the scale was created:



Information Box 5: School Discipline Scale

Figure 7.11 presents the South African school principal perceptions of the extent to which school discipline and safety is associated with Grade 4 learner reading achievement.

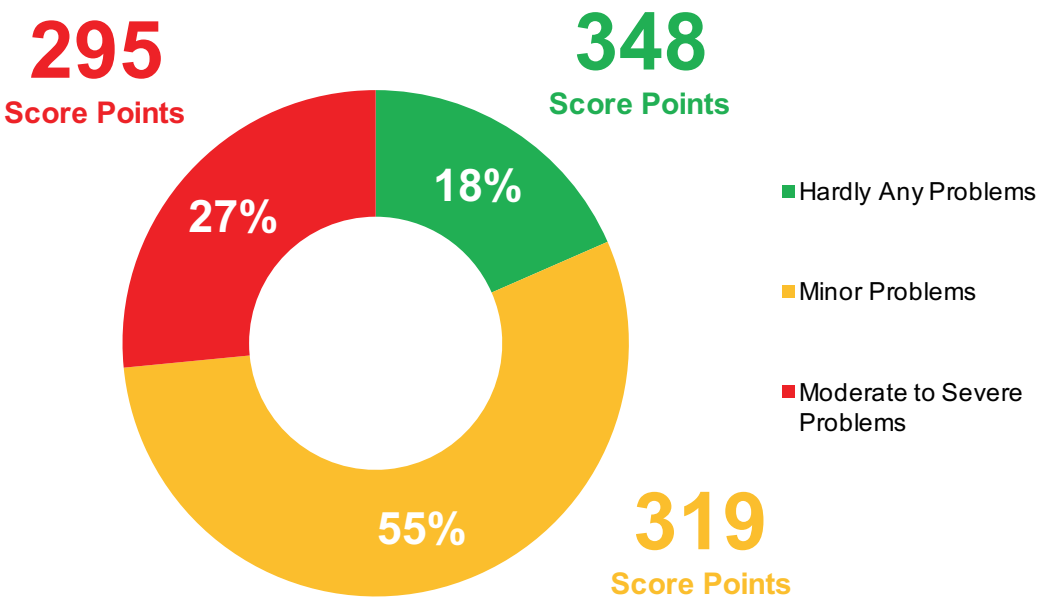


Figure 7.11: School Discipline and Safety and Grade 4 Learner Achievement

South African principals, together with the other African countries' principals, were the lowest three countries reporting *Hardly Any Problems* (18%) compared to 62% internationally meaning that proportionately more schools in the African countries had fewer problems compared to schools on other continents. A closer look reveals, however, that fewer South African principals (27%) reported having *Moderate to Serious Problems* than their African counterparts (Egypt 42% and Morocco 62%).

There seems to be an association between school discipline and safety and South Africa learner achievement (see Figure 7.12), as there is internationally. Learners achieved highest score of 348 (SE=13.8) when there were *Hardly Any Problems*. In contrast, this was significantly higher than learners who attended schools where there were *Moderate to Severe Problems* with an average score of 295 (SE=7.9).

Table 7.5 depicts the learner reading achievement per province on the three categories for school discipline and safety.

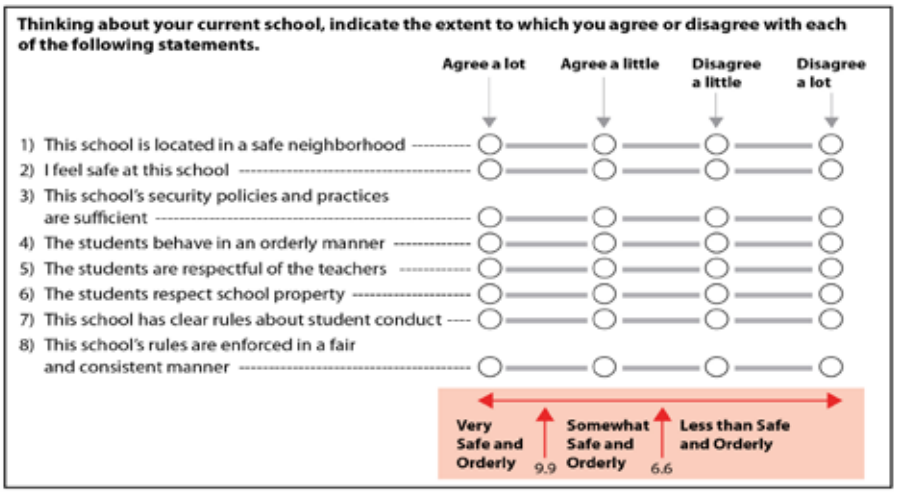
Table 7.5: School Discipline and Safety and Grade 4 Learner Achievement by Province

Province	School Discipline	% of Learners	SE of %	Mean Score	SE
Eastern Cape	Hardly any problems	17	7,8	325	38,6
	Minor problems	49	11,6	296	24,4
	Moderate to severe problems	34	10,6	258	20,6
Free State	Hardly any problems	12	3,7	322	13,8
	Minor problems	69	9,0	352	19,9
	Moderate to severe problems	19	8,5	334	15,5
Gauteng	Hardly any problems	20	8,8	431	43,8
	Minor problems	68	9,1	339	17,3
	Moderate to severe problems	12	6,6	331	12,6
KwaZulu Natal	Hardly any problems	16	7,0	343	19,9
	Minor problems	55	14,2	313	17,3
	Moderate to severe problems	30	14,2	304	17,2
Limpopo	Hardly any problems	30	8,8	305	9,7
	Minor problems	43	9,0	282	8,9
	Moderate to severe problems	27	9,4	267	11,0
Mpumalanga	Hardly any problems	8	5,4	295	16,3
	Minor problems	56	9,8	306	10,6
	Moderate to severe problems	36	8,2	328	22,0
North West	Hardly any problems	23	10,0	320	25,6
	Minor problems	53	12,9	320	10,1
	Moderate to severe problems	24	10,0	301	21,8
Northern Cape	Hardly any problems	19	10,8	397	24,7
	Minor problems	37	11,7	305	17,4
	Moderate to severe problems	43	13,2	302	16,7
Western Cape	Hardly any problems	16	8,4	441	39,4
	Minor problems	64	10,0	368	16,2
	Moderate to severe problems	20	6,6	344	10,1

The province with the highest percentage of *Moderate to Severe Problems* was the Northern Cape (43%) followed by Mpumalanga (36%) and the Eastern Cape (34%). The province reporting the largest percentage of learners in schools with *Hardly Any Problems* was Limpopo (30%). Across most provinces, learners in schools where there were *Hardly Any Problems* achieved higher scores than those in schools where *Moderate To Severe Problems* were found, with two exceptions – Free State and Mpumalanga. However, in three provinces (Gauteng, Northern Cape and Western Cape), there were highly significant differences between learners attending schools with *Hardly Any Problems* and those in schools with *Moderate to Severe Problems* (up to 100 points).

7.3.2.2 Safe and Orderly School

The PIRLS Literacy *Teacher Questionnaire* asked the teachers of Grade 4 learners the extent to which they agreed or disagreed with eight statements about school safety and orderliness (see the Information Box 6):



Information Box 6: Safe and Orderly Schools Scale

Figure 7.12 presents the percentage of school safety and orderliness according to teacher judgements about school safety and includes learner reading literacy scores.

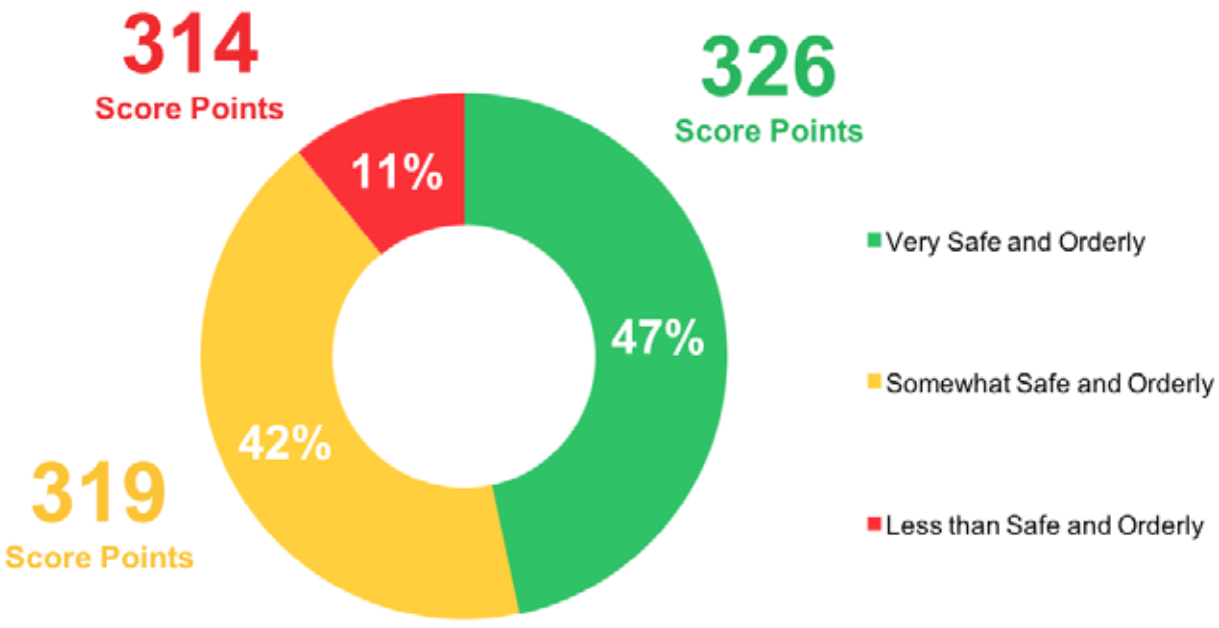


Figure 7.12: Teacher Reports on School Safety and Orderliness and Learner Achievement

Almost half (47%) of South African Grade 4 learners were in classes where teachers indicated that their school is *Very Safe and Orderly* whereas internationally most Grade 4 learners (62%) were in schools judged by their teachers to be *Very Safe and Orderly*. On average, 3% of learners were in schools judged internationally to be *Less than Safe and Orderly* compared to 11% of South African learners. This seems to have improved since 2011 when teachers reported feeling less safe. However, the sample of South Africa teachers was the only country where fewer than 85% of teachers returned the questionnaire and it is not clear to what extent this poor return impacts these findings.

Internationally, there appears to be a significant association between learner achievement and school safety (difference of 50 points). Nationally, learners tend to perform higher if the schools are reportedly safe and orderly (*Very Safe* 326, SE=8.2) compared to *Less than Safe* (314, SE=13.9).

Figure 7.13 presents the percentage of teacher reports on school safety and orderliness by language (LoLT) of the school.

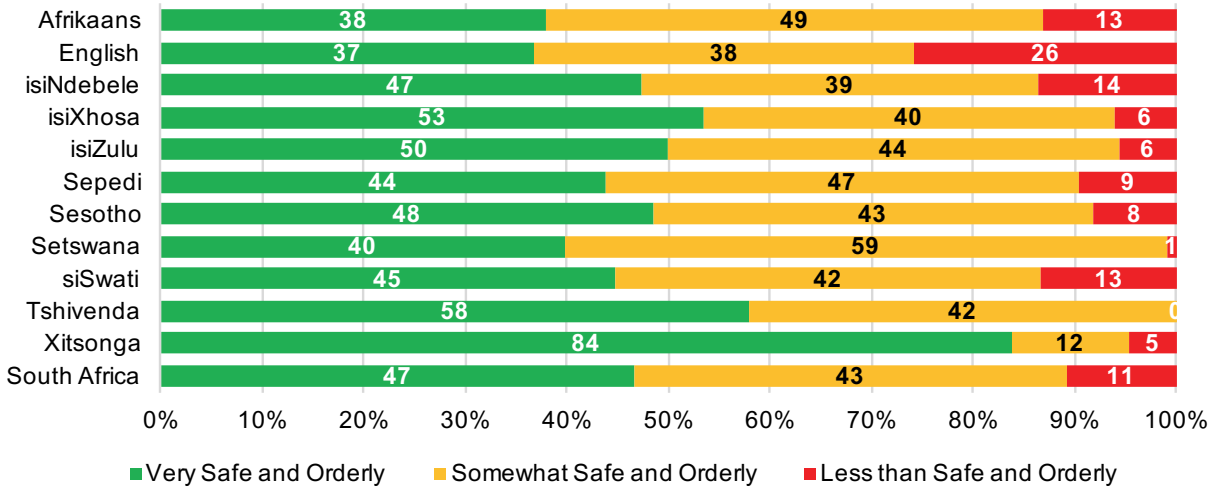
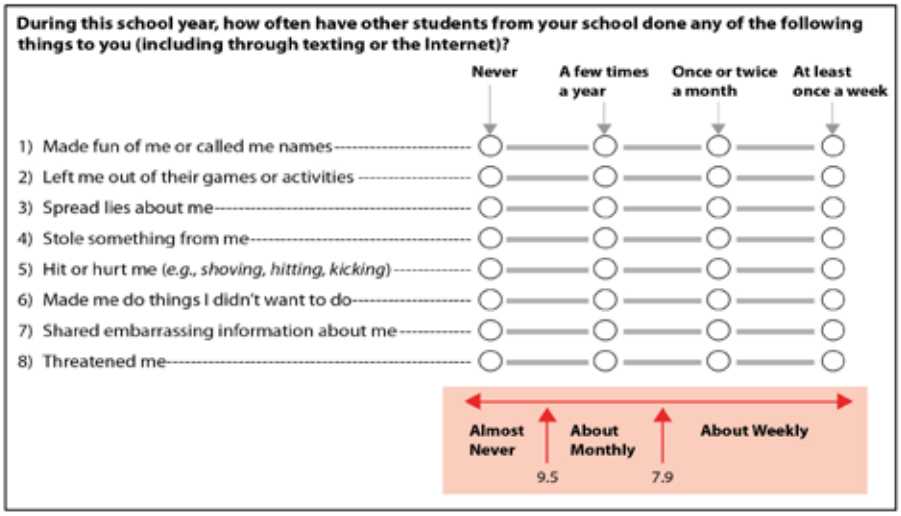


Figure 7.13: Teacher Reports on School Safety and Orderliness by language

The majority of learners' (84%) writing in Xitsonga had teachers who indicated that their schools are *Very Safe and Orderly* with very few (5%) reporting that their schools are *Less than Safe and Orderly*. About a quarter (26%) of learners' teachers in English LoLT schools reported that they experienced their schools as Less than Safe and Orderly. Interestingly, none of the Tshivenda learners' teachers reported that they experience their schools as *Less than Safe and Orderly*.

7.3.2.3 Learners bullied at School

PIRLS 2011 presented data on bullying as a problem in South Africa for the first time in an international study when South Africa was found to have the highest reported bullying levels. Whilst bullying occurs universally, monitoring bullying has become more challenging to counter the advent of cyber bullying. In South Africa, learners become aware of the concept of bullying from the first grades as this topic is included in the Life Orientation curriculum. It is not clear to what extent this has impacted on the reporting by learners, but increased awareness could have an effect. In order to determine how often Grade 4 learners were being bullied, a *Learners Bullied at School* scale was developed. The PIRLS Literacy *Learner Questionnaire* asked learners how often they experienced the following bullying behaviours (see Information Box 7) and for the first time included the notion of cyber bullying by including *through texting and the Internet*:



Information Box 7: Learners Bullied at School Scale

Internationally, it appears that bullying is less evident where most (57%) of the Grade 4 learners indicated that they are *Almost Never* bullied compared to 22% of South African learners. However, 42% of South African Grade 4 learners reported being bullied *About Weekly* compared to only 14% internationally. Figure 7.14 presents the percentage of South African learners being bullied.

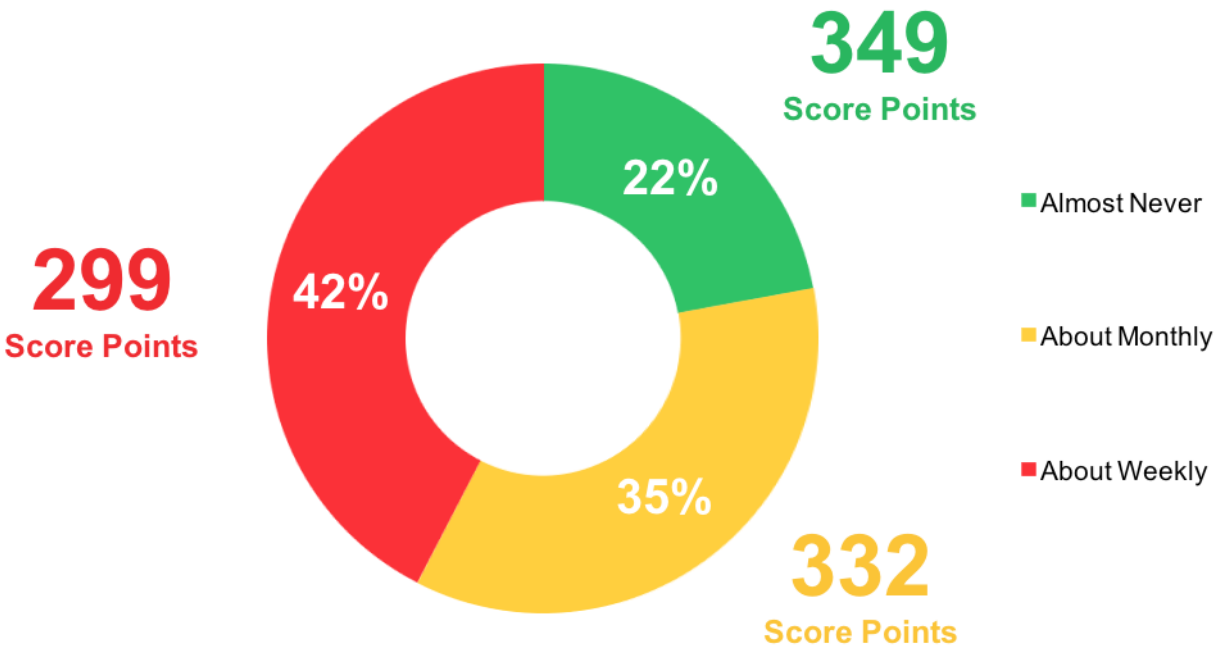


Figure 7.14: Grade 4 Learners bullied at School and Learner Achievement

Internationally, there appears to be a negative relationship between the frequency of bullying and achievement in reading. In South Africa, learners who are bullied weekly achieve significantly lower reading scores (299, SE=4.5) (50 points lower) than learners who are *Almost Never* bullied (349, SE=5.9). In general, South African Grade 4 learners who are *Almost Never* bullied achieve significantly higher reading scores compared to those who are bullied *About Monthly* and *About Weekly*.

Figure 7.15 indicates learner achievement when compared to the frequency of bullying by province.

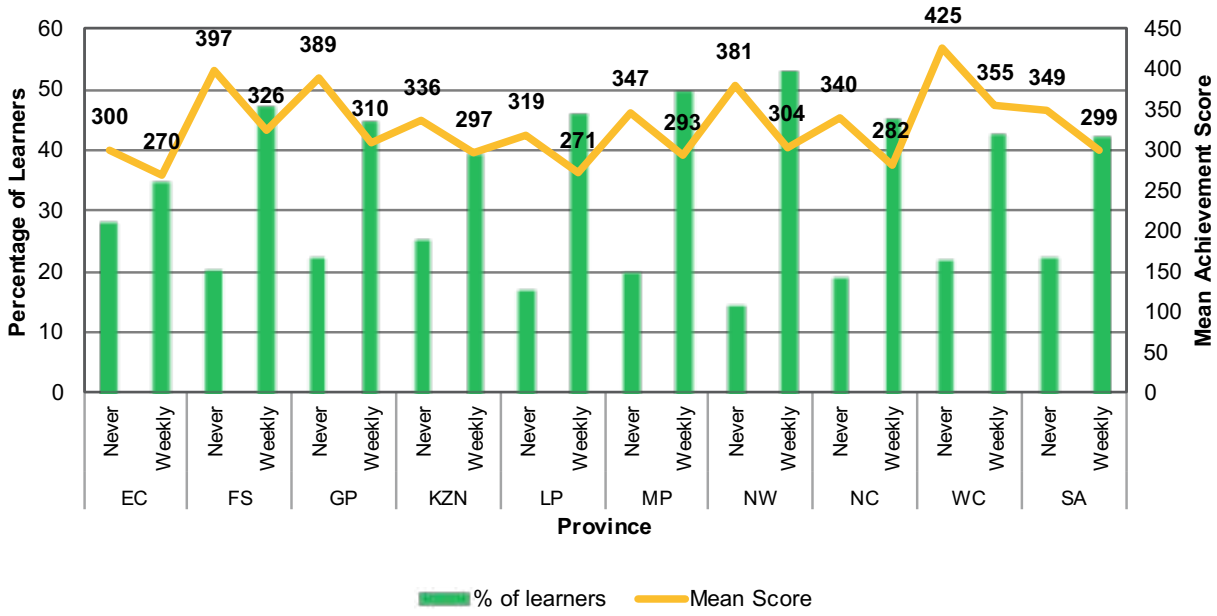
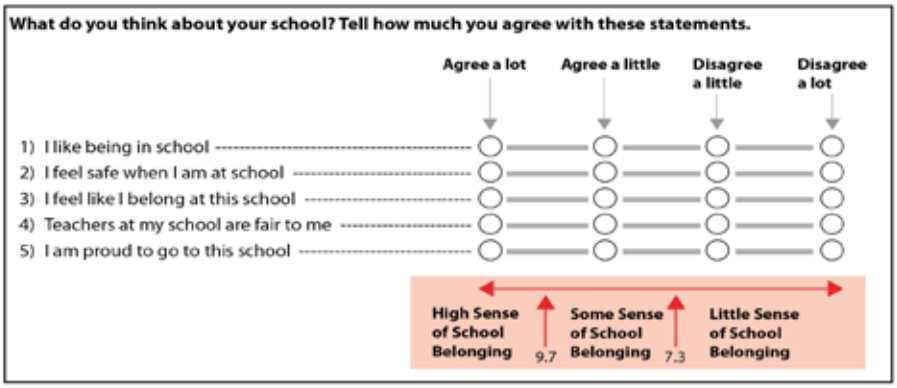


Figure 7.15: Learners bullied at School and Grade 4 Learner Achievement by Province

Within South African provinces, the percentage of learners *bullied weekly* varies from the lowest in Eastern Cape at 35% of learners to the highest reported in North West at 52%. In eight out of nine provinces, the reading achievement scores are higher when the learners are almost never bullied (the exception being the Eastern Cape). In all provinces, where bullying was reported weekly, this group of learners achieved the lowest scores. The difference in scores between learners who almost never got bullied compared to those who were bullied on a weekly basis, varied from 28 points in the Eastern Cape to 78 points in Gauteng and the North West, the equivalent of nearly two educational years.

7.3.2.4 Learner Sense of Belonging

The PIRLS Literacy *Learner Questionnaire* asked Grade 4 learners about how much they agreed with statements about their attitude toward school. Information Box 8 shows how the *Learner Sense of Belonging* scale was created.



Information Box 8: Learner Sense of Belonging Scale

On average, most learners (internationally and nationally) responded very positively. Internationally, more than half (59%) the learners had a *High Sense of Belonging* and very few (8%) reported *Little Sense of Belonging*. South African learners were in the top half of the international response and mirrored the international profile with 59% of South African Grade 4 learners reporting that they have a *High Sense of Belonging*. Figure 7.16 shows the percentage of South African learners' sense of belonging and its associated achievement.

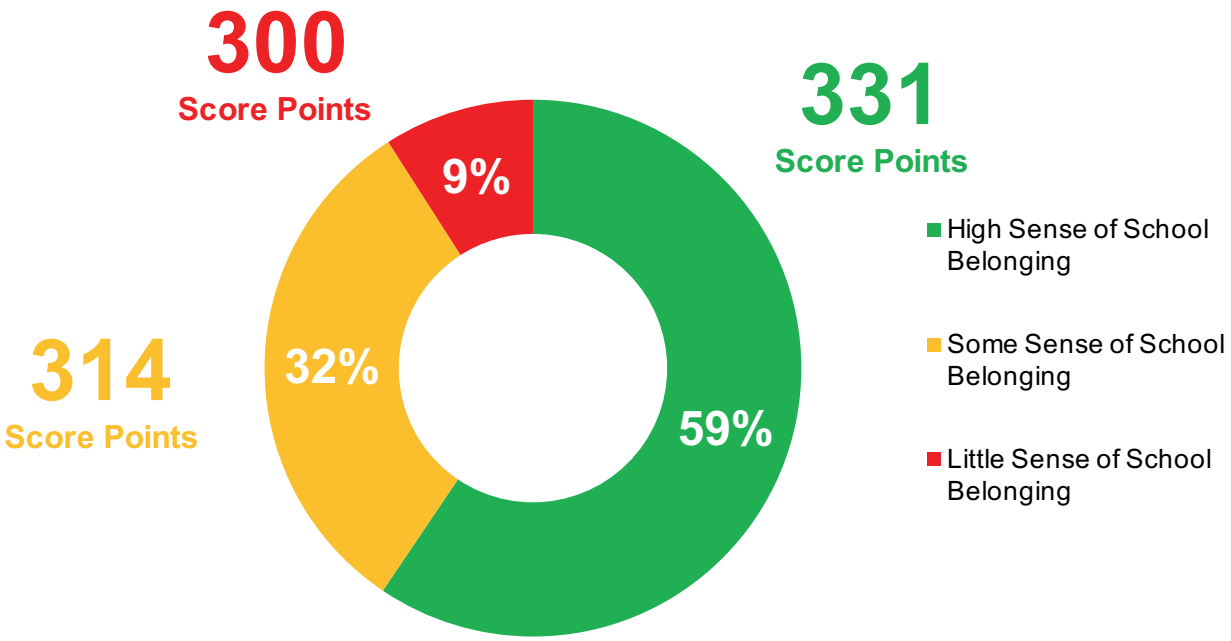


Figure 7.16: Grade 4 Learners' Sense of School Belonging and Learner Achievement

International and nationally, it appears that a higher sense of school belonging was related to higher learner reading achievement. South African learners, who indicated a *High Sense of Belonging*, achieved a reading achievement of 331 (SE=3.6) compared to those who indicated *Little Sense of Belonging* (300, SE=8.6).

7.3.3 Teacher Behaviour

Whilst teachers are key to successful learning, negative behaviours may have detrimental effects on learning and achievement. Within this study, teacher behaviour is seen as the certain actions of a teacher that could have a negative effect on learner achievement. When teachers are often late or absent from work, learner achievement lowers (see Miller, Murnane & Willett, 2007). The South African NEEDU (2013) report also found that a substantial amount of educational time was lost due to learner and teacher lateness and this loss of time on task could result in lower learner achievement. The PIRLS Literacy *School Questionnaire* asked school principals to what extent the school experienced problems related to teachers arriving late, leaving early, absenteeism or failure to complete the curriculum. Figure 7.17 illustrates the percentage of teachers with behavioural problems and the associated Grade 4 learner reading achievement scores.

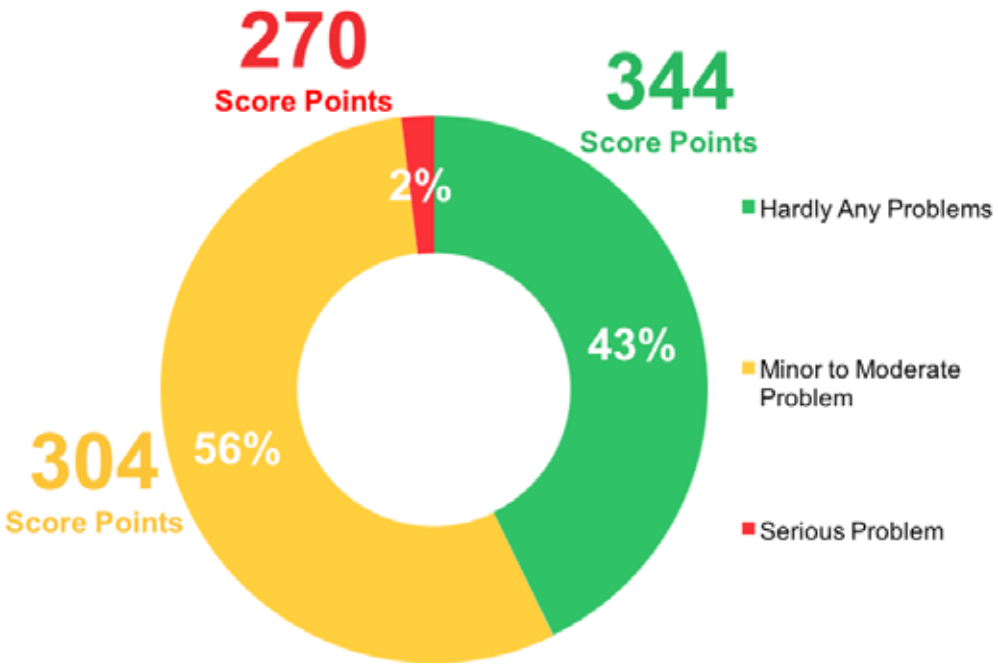


Figure 7.17: Teacher Behavioural Problems and Grade 4 Learner Achievement

Only 42% of learners were in schools where the principals reported that there are *Hardly Any Problems* with the teachers. Most of the principals (57%) did indicate that they experience behavioural problems with teachers but these varied from *Minor to Serious* with very few having *Serious Problems*. In particular, absenteeism and failure to complete the curriculum was a problem with teachers for 60% of learners as reported by principals. Teachers arriving late for school was reported for 46% of learners. These figures were significantly above those internationally. However, only two to four percent of learners were in schools where these issues were a *Serious Problem* for the principal.

An association between teacher behaviour and learner reading literacy achievement was

observed both internationally and nationally: those schools where there were more serious problems with teacher behaviour reported that learner achievement tended to be lower. There was a 75-point difference between learners in schools, where *Serious Problems* occur: learner achievement is 270 (SE=16.3) compared to those learners (344, SE=9.8) in schools whose teachers have *Hardly Any Problems* with school attendance and completing the curriculum.

The next table shows the percentage of learners affected by teacher behaviour and their average reading achievement scores by province.

Table 7.6: Learners affected by Teacher Behavioural Problems and Learner Achievement by Province

Province	Teacher Behaviour	% of learners	SE of %	Mean Score	SE
Eastern Cape	Hardly Any Problems	39	10.2	322	33.8
	Minor to Moderate Problem	61	10.2	269	12.9
	Serious Problem	~	~	~	~
Free State	Hardly Any Problems	44	12.2	368	30.1
	Minor to Moderate Problem	56	12.2	327	8.0
	Serious Problem				
Gauteng	Hardly Any Problems	63	9.9	385	22.4
	Minor to Moderate Problem	37	9.9	305	13.3
	Serious Problem	~	~	~	~
KwaZulu Natal	Hardly Any Problems	33	11.5	321	21.6
	Minor to Moderate Problem	67	11.5	312	10.8
	Serious Problem	~	~	~	~
Limpopo	Hardly Any Problems	50	9.1	298	8.2
	Minor to Moderate Problem	41	6.4	274	7.6
	Serious Problem	9	6.3	262	27.5
Mpumalanga	Hardly Any Problems	21	7.3	345	22.7
	Minor to Moderate Problem	77	7.7	303	10.8
	Serious Problem	2	2.0	330	4.3
North West	Hardly Any Problems	26	7.7	384	51.1
	Minor to Moderate Problem	74	7.7	310	9.7
	Serious Problem	~	~	~	~
Northern Cape	Hardly Any Problems	36	12.0	369	18.4
	Minor to Moderate Problem	50	12.3	305	14.2
	Serious Problem	14	12.6	265	7.0
Western Cape	Hardly Any Problems	58	8.6	358	16.0
	Minor to Moderate Problem	42	8.6	392	16.8
	Serious Problem	~	~	~	~
South Africa	Hardly Any Problems	43	3.5	344	9.8
	Minor to Moderate Problem	56	3.4	304	5
	Serious Problem	2	1	270	16.7

A tilde (~) means insufficient data.

Grade 4 learners in two provinces, namely Limpopo and Northern Cape, achieved the lowest average reading scores when their teachers' behaviour was a *Serious Problem*. It should be noted that even though the Eastern Cape Province did not have any *Serious Problems*, the learners whose teachers had *Minor to Moderate Problems* achieved similar mean scores to the learners in the Limpopo and Northern Cape Provinces whose teachers had *Serious Problems*. Interestingly, learners in the Western Cape whose teachers had *Minor to Moderate Problems* achieved the highest mean score of 392 (SE=16.8).

7.4 Conclusion

This chapter was devoted to describing the findings related to the school climate in South African schools. A large percentage (39%) of Grade 4 learners came from schools in remote rural areas. These learners also achieved considerably lower than their peers in other areas (see also Chapter 4). Almost two out of three school principals indicated that only 25-27% of learners entered their schools with early literacy skills. However, there is no difference in achievement scores if learners entered school with more than one-quarter or less than of early literacy skills.

Very few (6%) school principals reported that their schools are not affected by resource shortages. Almost nine out of ten (89%) school principals indicated that the inadequacy of the school resources hampered the teaching and learning process. Grade 4 learners who attended school where there are somewhat inadequate levels of school resources, achieved about 96 points lower than their peers who attended schools with no resource shortages. The majority of Grade 4 learners attended schools with no libraries and achieved on average 48 points less than schools with libraries. As with the school libraries, most learners (57%) attended school with no computers available for instruction. About one out of ten school principals reported that they have a computer available for every one to two learners. These learners also achieved 60 points higher than their peers who do not have access to computers.

Almost half of the learners attended schools that are considered safe and orderly although only a few school principals indicated that there are hardly any problems with school discipline and safety. Grade 4 learners achieved on average 53 points higher if they attended schools with little or no problems compared to learners who attended schools with moderate to severe problems. In schools where bullying occurred about weekly, the learners achieved 50 points lower than their peers who reported that they are almost never bullied at school. Learners were also asked to report on their sense of belonging at school. On average, when learners had a high sense of belonging, they scored 31 points more than those who have little sense of belonging.

Factors relating to the school environment and climate seem to be significant in the PIRLS Literacy study and are positively associated with the Grade 4 learners' reading literacy performance.

CHAPTER 8: INSIDE THE CLASSROOM WITH PIRLS LITERACY 2016: TEACHER PREPARATION AND THE CLASSROOM ENVIRONMENT

Karen Roux and Sarah Howie

8.1 Introduction

This chapter investigates what happens inside the classroom providing further insight into the actors and environment where the majority of teaching and learning takes place. Whilst many factors are associated with learner achievement, the classroom environment is one of the foremost important. Teachers have a variety of teaching styles and methods based on their background, education and experiences and as a result, learning is influenced by the type of environment created by the teacher and the type of activities used by the teacher (see Hattie, 2009). Teachers are the facilitators of learning new knowledge, skills, values as well as the assessors of learner performance and progress continuously throughout the year. For these reasons, PIRLS Literacy has a number of questions in its *Teacher*, *Principal* and *Learner Questionnaire*s probing the conditions in the classroom as well as describing the teacher profiles, resourcing, instructional strategies and activities enacting the curriculum.

The chapter consists of two main sections, Teacher Preparation and Experience (8.2) and the Classroom Environment (8.3). The former will focus on teacher educational background, age, experience and professional development. The second section will describe learner attitude toward reading, instructional time, teaching approaches and classroom resources.

This chapter intends to describe the South African classroom found during the PIRLS Literacy 2016 and identify possible factors that may have relationship with South African Grade 4 learner reading literacy achievement.

8.2 Teacher Preparation and Experience

Teachers' professional background is crucial to the successful development of learner reading literacy. One of the foremost factors of learner achievement, especially in Southern Africa is teacher preparation and competence (Croninger, Rice, Rathbun & Nishio, 2007; Passos, 2009). All teachers need to have sound knowledge in their respected fields, in this case language and reading, as well as effective pedagogy in teaching these subjects (Mullis & Martin, 2015). In PIRLS Literacy, teachers were asked specific questions regarding their formal education, years of experience, professional development and career satisfaction to gain insight into their teaching milieu. As explained in Chapter 3, the teachers who responded to the questionnaires were the home language teachers of those learners tested in PIRLS Literacy 2016.

8.2.1 Teachers' Formal Education, Age and Years of Experience

The PIRLS Literacy *Teacher Questionnaire* asked the teachers about their formal education, age and years of experience.

8.2.1.1 Teachers' Formal Education

In the questionnaire, a number of options were included for teachers' education level. The option included in the South African questionnaires, and not internationally, was *Honours Degree*[24]. The international options[25] were *Did not complete Grade 12/Standard 10, Grade 12/Standard 10, Post-Secondary Training, Technikon Diploma, Bachelor's Degree, Master's Degree and Doctoral Degree*.

Table 8.1 presents teachers' highest level of formal education, in conjunction with Grade 4 learner reading achievement.

Table 8.1: Highest level of Teachers' Formal Education

Teacher Education	% of Learners	SE of %	Mean Score	SE
Did Not Complete Grade 12/Standard 10	1	0.6	344	13.2
Grade 12/Standard 10	6	1.7	281	15.2
Post-Secondary Education*	45	3.9	316	7.4
Bachelor's Degree	30	3.7	351	11.9
Postgraduate Degree#	18	2.9	316	6.6

* The category Post-Secondary Education includes Technikon Diploma and Post-Secondary Training.
# The category Postgraduate Degree includes Honours Degrees, Master's Degrees and PhD Degrees.

Internationally, most (60%) Grade 4 learners were taught by teachers who had obtained a *Bachelor's Degree* with a further 26% having completed a *Postgraduate Degree*. In South Africa, the largest group of teachers teaching 45% of learners had completed *Post-Secondary Education* (see Table 8.1) (compared to 11% internationally). Less than one-third had completed a *Bachelor's Degree* (30%). Seven percent of South Africa learners are taught by teachers not meeting the minimum requirements for appointment as a teacher compared to three percent internationally. Of these, one percent had *Not Completed Grade 12/Standard 10*.

Grade 4 learners achieved lower scores when their teachers had a *Postgraduate Degree* (316, SE=6.6) compared to those whose teachers had a *Bachelor's Degree* (351, SE=11.9). There is a 36-point difference in learner achievement when comparing teachers who had a completed a *Bachelor's Degree* to those who had obtained a *Postgraduate Degree* and those with *Post-Secondary Education*.

The next figure shows the highest level of formal education reported by teachers across provinces.

[24] The option Honours Degree was included in the Postgraduate Degree for reporting purposes.
[25] The international options were contextualised for all participating countries.

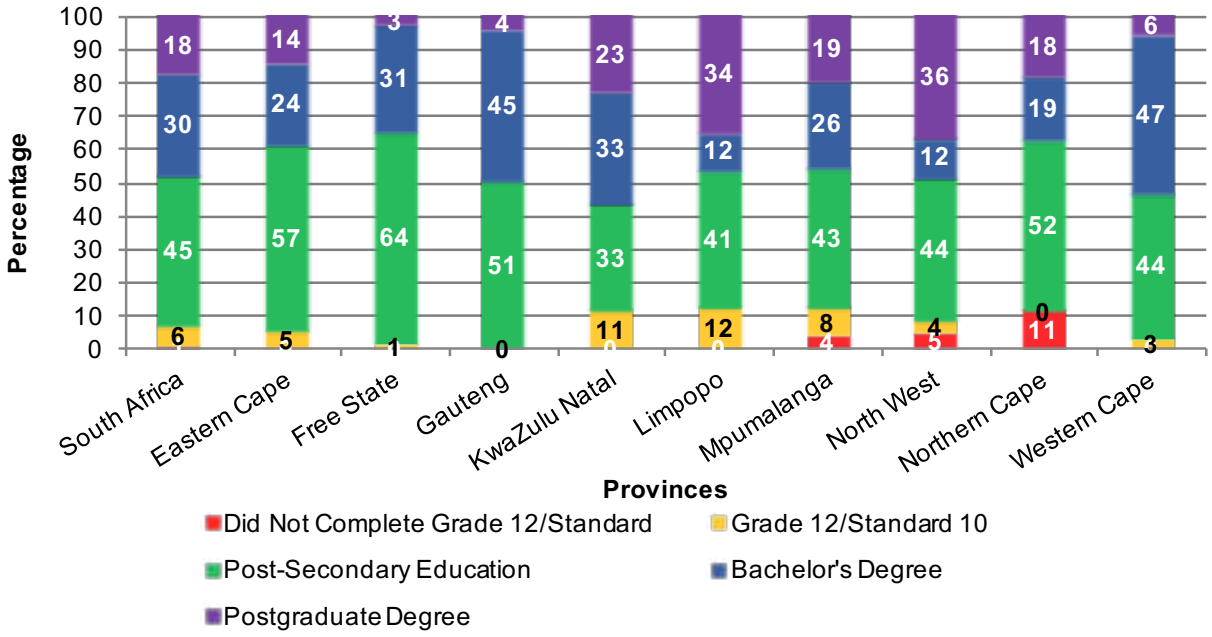
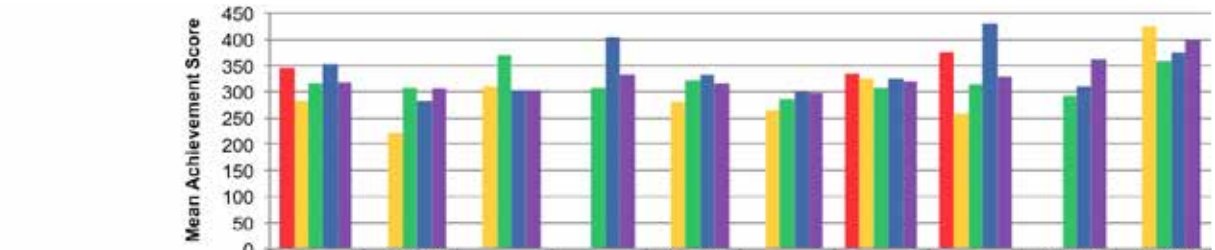


Figure 8.1: Highest Level of Formal Education reported by Teachers across Provinces

The largest group in almost all provinces was *Post-Secondary Education*, where between 33-64% of learners had teachers who did not have degrees but other post-secondary qualifications. Learners taught by teachers with a *Bachelor's Degree* varied greatly in prevalence from 12% (Limpopo and North West) to 47% (Western Cape).

Of concern regarding all provinces is that learners are being taught by teachers who do not meet the minimum requirements for teachers as their highest level of qualification was *Grade 12/Standard 10*. Whilst they represented 12% of learners nationally, they represented from 0% in Gauteng to 12% in Limpopo. Of greater concern were teachers who had *Not Completed Grade 12*. Whilst they represented one percent nationally, this varied across provinces with Mpumalanga (4%), North West (5%) and Northern Cape (11%).



	South Africa	Eastern Cape	Free State	Gauteng	KwaZulu Natal	Limpopo	Mpumalanga	North West	Northern Cape	Western Cape
Did Not Complete Grade 12/Standard	344						334	374		
Grade 12/Standard 10	281	221	309		279	264	324	258		423
Post-Secondary education	316	307	368	307	320	285	307	313	292	356
Bachelors' Degree	351	281	302	403	332	300	324	428	310	373
Post Graduate Degree	316	304	302	332	315	297	318	328	361	397

Note: Cells are empty when option was not chosen in province.

Figure 8.2: Teacher Education and Learner Achievement across Provinces

The highest performance across provinces were learners in North West (428, SE=101.8)[26] whose teachers had *Bachelor's Degree* followed by Grade 4 learners from the Western Cape province whose teachers had only completed *Grade 12/Standard 10* compared to those learners who had a *Bachelor's Degree* (373, SE=19.0). The lowest performance was found amongst 5% of Grade 4 learners in the Eastern Cape (221, SE=6.5) taught by teachers who had completed *Grade 12/Standard 10*.

There was no discernible pattern of relationship between formal qualification and achievement across provinces, although in four provinces, the highest performance was by learners taught by teachers holding a *Bachelor's Degrees*. A closer look at teachers' teaching qualifications may shed more light. Table 8.2 presents the teachers' type of teaching qualification and learner achievement.

Table 8.2: Type of Teaching Qualification and Learner Achievement

Teacher Qualification	% of Learners	SE of %	Mean Score	SE
No teacher qualification	2	1.2	447	83.4
Primary Education				
Junior Primary Teachers' Certificate (JPTC)	4	2.0	323	36.9
Senior Primary Teachers' Certificate (SPTC)	6	2.1	284	25.6
3-year Diploma in Education	27	3.8	315	7.5
4-year Diploma in Education	10	2.4	302	17.1
Bachelor of Primary Education (BPrimEd)	1	0.7	341	5.0
Bachelor of Education (BEd Foundation Phase)	0	0.3	460	7.4
Bachelor of Education (BEd Intermediate Phase)	12	3.3	361	20.5
Bachelor of Education (BEd Senior Phase)	2	0.8	358	25.4
Higher Diploma of Education (HDE)	6	1.9	327	21.6
Postgraduate Certificate of Education (PGCE)	1	0.7	277	6.6
Advanced Certificate of Education (ACE)	7	2.3	299	13.4
Further Diploma of Education (FDE)	1	1.1	483	128.6
National Professional Diploma in Education (NPDE)	1	0.5	329	14.0
Secondary Education				
Senior Teachers' Certificate (STC)	1	0.5	349	6.1
3-year Diploma in Education	5	2.0	350	27.3
4-year Diploma in Education	3	1.6	329	45.9
Bachelor of Education (BEd Languages)	5	1.8	362	17.8
Bachelor of Education (BEd Science)	1	0.9	218	33.9
Higher Diploma of Education (HDE)	1	0.6	341	41.1
Postgraduate Certificate of Education (PGCE)	3	1.6	391	66.0
Advanced Certificate of Education (ACE)	0	0.4	194	17.8
Further Diploma of Education (FDE)	0	0.5	330	4.6
National Professional Diploma in Education (NPDE)	1	0.5	349	5.3

Very few (2%) teachers indicated that they did not have a qualification in education. About one-quarter (27%) of teachers reported that they have a *3-year Diploma in Education* in primary education. Learners taught by these teachers obtained an average reading literacy score of 315 (SE=7.5). In comparison, learners who were taught by teachers with a *Bachelor in Education (BEd Foundation Phase)* had an average score of 460 (SE=7.4), which is 146 points

[26] The exceptionally large Standard Error (SE) indicates the variation within this category and therefore these findings are treated cautiously.

higher than those learners whose teachers had a *3-year Diploma in Education*.

8.2.1.2 Emphasis on Language and Reading Areas in Teachers' Formal Education

The PIRLS Literacy questionnaire also asked teachers about their areas of specialisation in their formal training, specifically *Language, Pedagogy/Teaching Reading and Reading Theory*. Internationally, the majority (70%) of teachers indicated that their education included an emphasis on Language. The international results do not reveal a relationship between an emphasis on these specialisation areas and learner average reading achievement. Similar findings emerged in South Africa (see Table 8.3), although the highest scores were obtained by learners whose teachers had a language emphasis.

Table 8.3: Language and Reading Areas Emphasised in Teachers' Formal Education

		Area Emphasised		Area Emphasised		Area Not Emphasised	
	Reading Area	% of Learners	SE	Mean Score	SE	Mean Score	SE
South Africa	Test Language	71	3.7	328	6.7	313	10.2
	Pedagogy/Teaching Reading	58	4.1	320	7.8	330	9.7
	Reading Theory	36	4.1	313	6.3	330	8.7
International Average	Test Language	70	0.4	512	0.5	510	1.1
	Pedagogy/Teaching Reading	64	0.5	512	0.6	509	0.9
	Reading Theory	32	0.5	511	0.8	511	0.6

Most (71%) of South African teachers reported that emphasis was placed on *Language* during their formal education training. Just over one-third (36%) of teachers also indicated that *Reading Theory* was emphasised during their training. Table 8.4 gives a breakdown of the areas emphasised in teachers' formal education by province.

Table 8.4: Language and Reading Areas Emphasised in Teachers' Formal Education by Province

Province	Reading Area	Area Emphasised		Area Emphasised		Area Not Emphasised	
		% of Learners	SE	Mean Score	SE	Mean Score	SE
Eastern Cape	Test Language	55	11.6	310	21.7	278	18.0
	Pedagogy/Teaching Reading	63	11.0	292	18.1	286	35.4
	Reading Theory	38	9.2	272	23.3	313	29.4
Free State	Test Language	65	6.3	331	5.3	326	7.8
	Pedagogy/Teaching Reading	43	10.3	339	6.6	329	9.0
	Reading Theory	45	10.9	338	7.8	330	7.4
Gauteng	Test Language	83	6.3	353	28.5	372	51.1
	Pedagogy/Teaching Reading	59	10.0	328	31.5	400	28.9
	Reading Theory	31	9.2	325	13.8	362	30.7
KwaZulu Natal	Test Language	67	11.2	327	11.6	305	14.8
	Pedagogy/Teaching Reading	35	13.0	325	13.2	319	14.4
	Reading Theory	26	10.2	329	16.7	318	11.9
Limpopo	Test Language	77	8.7	289	7.6	286	7.7
	Pedagogy/Teaching Reading	57	5.9	273	11.3	289	8.1
	Reading Theory	47	9.2	265	12.3	292	6.0
Mpumalanga	Test Language	78	7.8	304	14.5	358	23.5
	Pedagogy/Teaching Reading	64	10.5	304	15.1	305	18.0
	Reading Theory	44	11.1	314	10.0	300	12.8
North West	Test Language	61	9.3	322	13.5	338	34.7
	Pedagogy/Teaching Reading	66	12.0	323	12.8	345	40.0
	Reading Theory	24	10.2	321	18.9	328	20.8
Northern Cape	Test Language	64	14.1	323	19.4	282	13.8
	Pedagogy/Teaching Reading	51	15.9	324	23.4	323	21.0
	Reading Theory	47	17.4	316	31.3	328	18.2
Western Cape	Test Language	86	8.3	373	13.0	364	21.2
	Pedagogy/Teaching Reading	81	8.2	375	14.1	383	34.1
	Reading Theory	51	11.7	354	21.1	394	19.8
South Africa	Test Language	71	3.7	328	6.7	313	10.2
	Pedagogy/Teaching Reading	58	4.1	320	7.8	330	9.7
	Reading Theory	36	4.1	313	6.3	330	8.7

In seven provinces, the emphasis was stronger on *Language*; however, in the Eastern Cape and North West, the emphasis was greater for *Pedagogy/Teaching Reading*. In the Western Cape, a similar high proportion also had a strong emphasis on *Language* (86%) compared to *Pedagogy/Teaching Reading* (81%).

Even though most teachers' formal education had an emphasis on *Language, Pedagogy/Teaching Reading and Reading Theory*, there only seems to be a positive association between *Language* and learner achievement. Overall, South African Grade 4 learners achieved an average score of 328 (SE=6.7) when *Language* was emphasised during their teachers' formal training. Across provinces, the highest scores were achieved by learners whose teachers had specialised in either *Language* (four provinces) or *Pedagogy/Teaching Reading* (four provinces).

8.2.1.3 Teachers' Age Profiles

PIRLS 2011 raised the concern about the ageing teaching force in 2012 and the small number entering teaching as teacher replenishment is a critical issue in South Africa. Figure 8.3 shows that about half (49%) of the South African Grade 4 learners' teachers were aged between 40 and 49 years followed by 50 to 59 (28%) and as a result, teachers were older in comparison to their peers internationally.

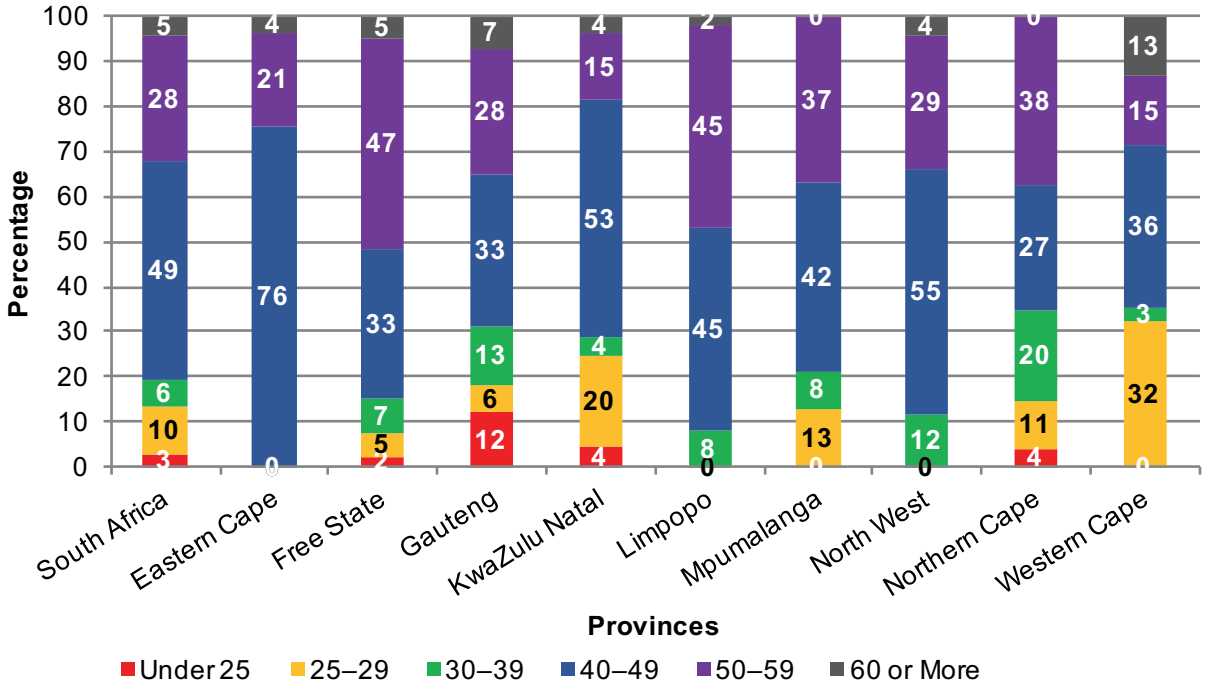
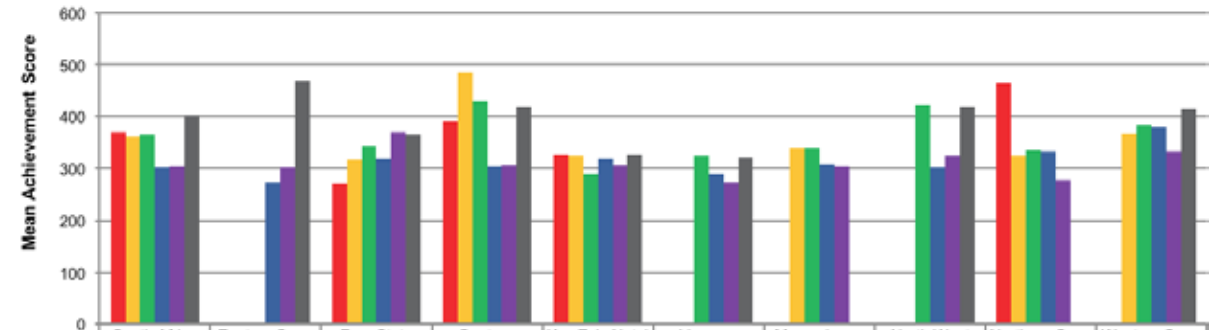


Figure 8.3: Teachers' Age Profile across Provinces

Across all the provinces, 60% and more of learners were taught by teachers older than 40 years. In four provinces, 80% and more of learners were taught by teachers older than 40 years, and in the Eastern Cape, all responding teachers (100%) were over 40 years of age and of those, four percent were over 60 years. In Limpopo, 92% of learners were taught by teachers who were over 40 years of age.

In almost all provinces, the largest group of teachers found in each province was in the 40-49 years age-bracket, with the exception of the Northern Cape, whose largest group were aged 50-59. Few teachers were evident in the under-25 group.



	South Africa	Eastern Cape	Free State	Gauteng	KwaZulu Natal	Limpopo	Mpumalanga	North West	Northern Cape	Western Cape
Under 25	370		271	389	327				464	
25–29	361		316	485	324		339		324	367
30–39	365		343	430	290	324	339	423	334	385
40–49	303	273	318	305	317	290	307	301	333	380
50–59	305	302	369	305	305	274	304	324	277	333
60 or More	402	467	365	420	327	320		419		415

Note: Cells are empty when option was not chosen in province.

Figure 8.4: Teachers' Age Profile and Learner Achievement across Provinces

In general, learners whose teachers were 60 years old or more achieved the highest reading achievement (402, SE=28.9)[27], followed by teachers who were younger than 25 years (370, SE=23.0). It should be noted that the Standard Errors are quite large for both these categories. Learners taught by teachers who are between the ages of 40 and 49, achieved the lowest reading achievement (303, SE=6.3).

8.2.1.4 Teachers' Years of Experience

It has been found that teacher experience can have a considerable effect on effectiveness during the first couple of years of teaching (Mullis & Martin, 2017; Harris & Sass, 2011). Figure 8.5 presents Grade 4 teachers' years of experience as well as Grade 4 learner achievement.

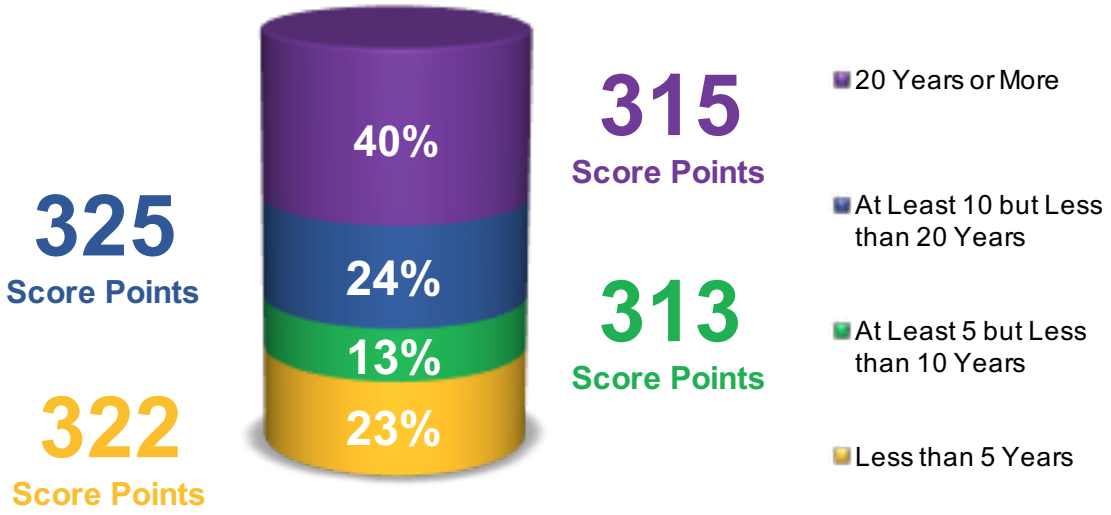


Figure 8.5: Teacher Experience and Learner Achievement Scores

Internationally about 42% of learners had very experienced teachers with *20 Years or More* of experience and South Africa follows a similar pattern (40%). On average, teachers internationally have 17 years of experience compared to South Africa at 15 years. The PIRLS Literacy 2016 teacher experience average for South Africa is reduced by two years from 17 years in PIRLS 2011 (see Howie et al., 2012), suggesting there are fewer experienced teachers in the system than five years ago and is back to the levels seen in PIRLS 2006 at Grade 5 (p.93).

No statistically significant differences were found globally between experience and learner achievement. In South Africa, Grade 4 learners seem to achieve higher average achievement when their teachers have either between 10 and 20 years of experience (325, SE=7.6) or less than 5 years of experience (322, SE=11.4). A curvilinear pattern is observed when comparing teachers' years of experience and learner achievement.

[27] The Standard Error (SE) is large and seems to have much variation in this category.

8.2.2 Teacher Professional Development

Harris and Sass (2011) found that junior and senior primary learners learn more when their teachers have participated in content-focused professional development. Professional development is included as part of national policies and legislation, specifically with the South African Council of Education (SACE) Act No. 31 of 2000. South African teachers are awarded Continuing Professional Development (CPD) points for certain training completed, which is aimed at enhancing their teaching effectiveness within the classroom. The following table presents the percentage of teachers' reports on time allocated to professional development relating to reading.

Table 8.5: Teacher Professional Development

Teacher Professional Development	% of Learners	SE of %	Mean Score	SE
None	9	1.9	326	21.2
Less than 6 hours	24	3.3	323	9.1
6–15 hours	25	3.0	315	13.7
16 or more hours	43	3.8	322	7.6

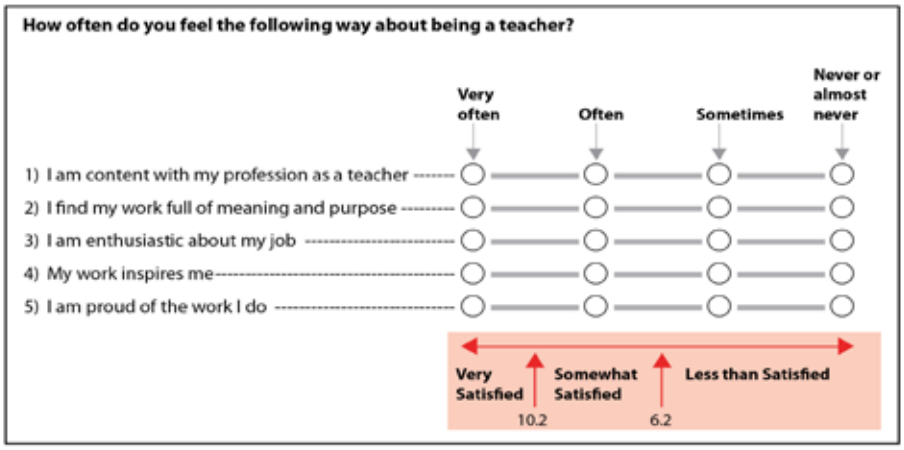
Internationally most teachers did not spend much time on professional development and only 36% of learners internationally were taught by teachers who spent *16 Hours or More*. However, in South Africa, a higher percentage (43%) of learners were taught by teachers who spent *16 Hours or More* on professional development. Internationally, 16% of learners were taught by teachers who spent no time on professional development in comparison to nine percent in South Africa.

Internationally, there was no discernible relationship between time spent and achievement and a similar observation was made in South Africa. Grade 4 learners whose teachers attend *16 Hours or More* of professional development achieved average reading scores of 322 (SE=7.6) compared to learners of teachers who do not attend any professional development, and whose learners reached an average score of 326 (SE=21.2). A possible reason for the anomaly could be that the teachers, who do not attend any professional development, read additional development materials on their own or that those attending courses are doing so for the remedial needs of their learners.

8.2.3 Teacher Career Satisfaction

Generally, teachers who are more satisfied with their career and working conditions at their school are more motivated to prepare lessons and teach more effectively. Teachers with career satisfaction might be more committed to the profession, and as a result, may be more likely to continue teaching. The PIRLS Literacy *Teacher Questionnaire* asked teachers to respond to five statements related to job satisfaction: I am content with my profession as a teacher, I find my work full of meaning and purpose, I am enthusiastic about my job, My work inspires me, I am proud of the work I do. They were asked to rate them from *Very Satisfied, Somewhat Satisfied* and *Less Than Satisfied*.

The information box below indicates how the scale was created.



Information Box 1: Teacher Career Satisfaction Scale

Contrary to what might have been expected, given the many schools with difficult conditions in South Africa, teachers reported relatively higher levels of satisfaction and their reports rated near the top quarter of the 50 countries with 65% of South African learners' teachers being very satisfied. Whilst nationally and internationally this group of teachers had learners with higher results than those who were *Somewhat Satisfied*, the group of South Africa teachers who were *Less than Satisfied* had learners achieving the highest results (376, SE=20.4)[28]. This was also the case internationally. A closer look at this seeming anomaly is needed. Figure 8.6 shows the percentage of teachers' career satisfaction along with the associated learner achievement.

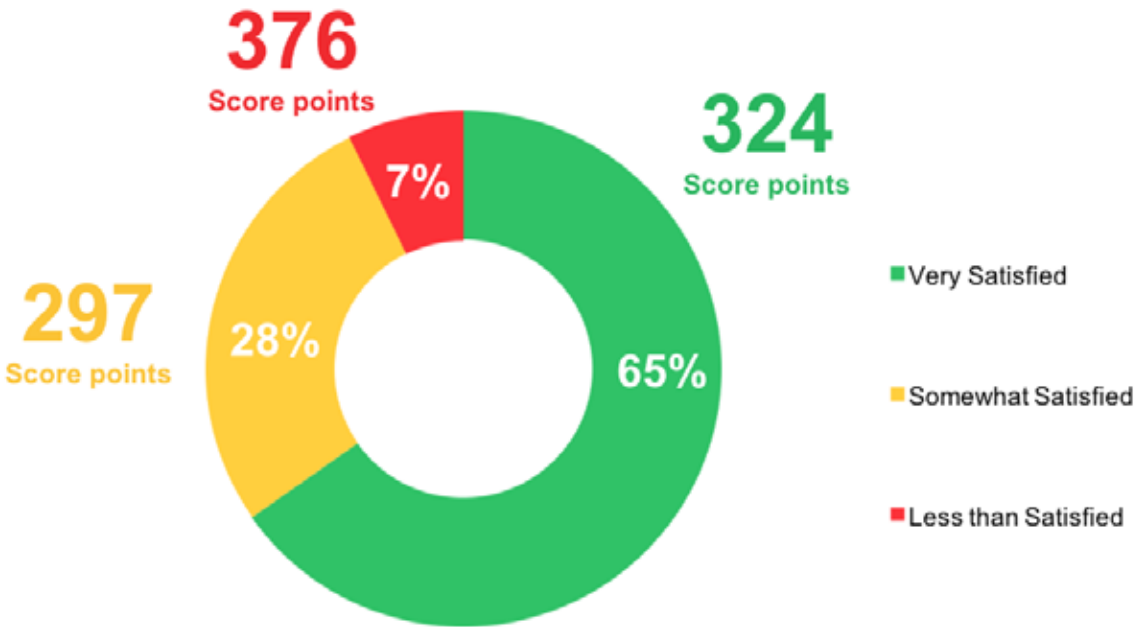


Figure 8.6: Teacher Career Satisfaction and Learner Achievement

[28] The large Standard Error (SE) suggests that whilst there are many higher achieving learners with teachers who are less than satisfied, that there are also several low achieving learners with teachers in that group.

Grade 4 learners whose teachers reported to be *Very Satisfied* with their careers attained reading literacy achievement scores of 325 (SE=6.1) whereas learners whose teachers were *Less than Satisfied* achieved the highest scores[29] (376, SE=20.4). Overall, teachers seem to be satisfied within the teaching profession.

8.3 Classroom Environment

Usually when learners have a more positive attitude towards reading, achievement scores are higher, although fluent readers may also have more confidence and thus are more positive. There are a number of other factors that could impact learner achievement, which include good nutrition, adequate levels of sleep and classroom resources. This section specifically investigates the classroom environment since it is at the core of learning and describes learner attitude towards reading, absenteeism, readiness to learn as well as instructional times and approaches and classroom resources. In PIRLS 2016 Literacy, the average class had 45 learners per Grade 4 class. However, class sizes differed greatly between the language groups (see Table 8.6) and provinces (see Table 8.7).

Table 8.6: Average Class size by Language for South Africa PIRLS Literacy Grade 4 Study

	Average class size
South Africa	45
Afrikaans	35
English	42
isiNdebele	42
isiXhosa	46
isiZulu	45
Sepedi	47
Sesotho	48
Setswana	51
siSwati	55
Tshivenda	46
Xitsonga	52

The languages with the most learners on average per class were siSwati (55 learners), Xitsonga (52 learners) and Setswana (51 learners). Table 8.7 shows the average class size by province.

[29] The Standard Error (SE) is large and seems to have much variation within the category.

Table 8.7: Average Class Size by Province for South Africa PIRLS Literacy Grade 4 Study

	Average class size
South Africa	45
Eastern Cape	48
Free State	49
Gauteng	41
KwaZulu Natal	44
Limpopo	49
Mpumalanga	49
North West	50
Northern Cape	37
Western Cape	37

The North West province had the largest class sizes in the Grade 4 PIRLS Literacy Study with 50 learners on average per class, followed closely by Mpumalanga (49), Limpopo (49), Free State (49) and Eastern Cape (48). Most language groups and provinces had class sizes of 40 or more learners per class, which was far higher than the international PIRLS average of 24.

8.3.1 Learner Attitude towards Reading

Every cycle of PIRLS has shown a strong positive relationship between learner attitude toward reading and their reading achievement (see Howie et al., 2012, Howie et al., 2009). However, the relationship is bidirectional (Mullis et al., 2012) as these two aspects, enjoying reading and reading achievement, mutually influence each other. As such, learners who like reading tend to achieve higher reading achievement scores. Figure 8.7 shows the percentage of Grade 4 learners who like reading and their average achievement.

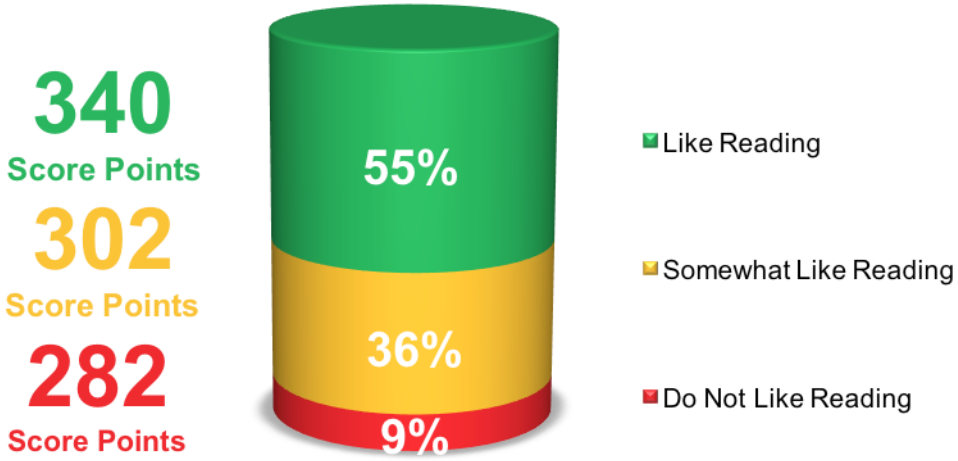


Figure 8.7: Learners who like Reading and Learner Achievement

Internationally, almost half of the learners (43%) reported that they liked to read compared to more than half (55%) of South African learners who liked to read. South African learners who indicated that they liked to read, achieved higher average reading achievement (340, SE=3.7) than those who somewhat like reading (302, SE=5.6). There is a 38-point difference between these two groups. The next table shows a breakdown of the South African Grade 4 learner achievement and the extent to which they like reading across languages.

Table 8.8: Learners who like reading and their associated Achievement across Languages

Language	Very Much Like Reading		Somewhat Like Reading		Do Not like Reading	
	Mean Score	SE	Mean Score	SE	Mean Score	SE
Afrikaans	388	11.5	355	18.1	361	20.8
English	408	10.7	347	20.4	327	19.2
isiNdebele	331	9.3	284	16.1	289	28.6
isiXhosa	307	9.0	271	11.6	213	14.6
isiZulu	318	4.1	288	5.7	244	14.0
Sepedi	292	6.8	242	7.2	211	21.9
Sesotho	341	7.1	296	8.9	267	10.0
Setswana	328	7.2	274	6.4	260	12.9
siSwati	337	7.1	292	8.2	244	11.4
Tshivenda	336	8.3	285	7.1	246	13.7
Xitsonga	336	4.6	282	9.1	236	14.0
South Africa	340	3.7	302	5.6	282	9.1

Learners, who indicated that they *Very Much Like Reading* and wrote the PIRLS Literacy assessment in English, achieved the highest mean score (408, SE=10.7), whereas learners who wrote the assessment in Sepedi, obtained the lowest mean score (292, SE=6.8). In general, when learners like to read, they also achieved higher reading scores.

8.3.2 Learner Absenteeism

A study conducted by Gottfried in 2009 has examined how learner absences affect their academic achievement. The aforementioned study did, however, split learner absence into excused and unexcused and explained that learners who are not excused from being absent from school, tend to be “at-risk academically” (Gottfried, 2009, p.410). However, when learners are absent more often than not, it is negatively associated with their academic achievement.

Learners were asked to indicate to what extent they were absent from school. On average, most learners (51%) are *Never* or *Almost Never* absent from school (see Figure 8.8).

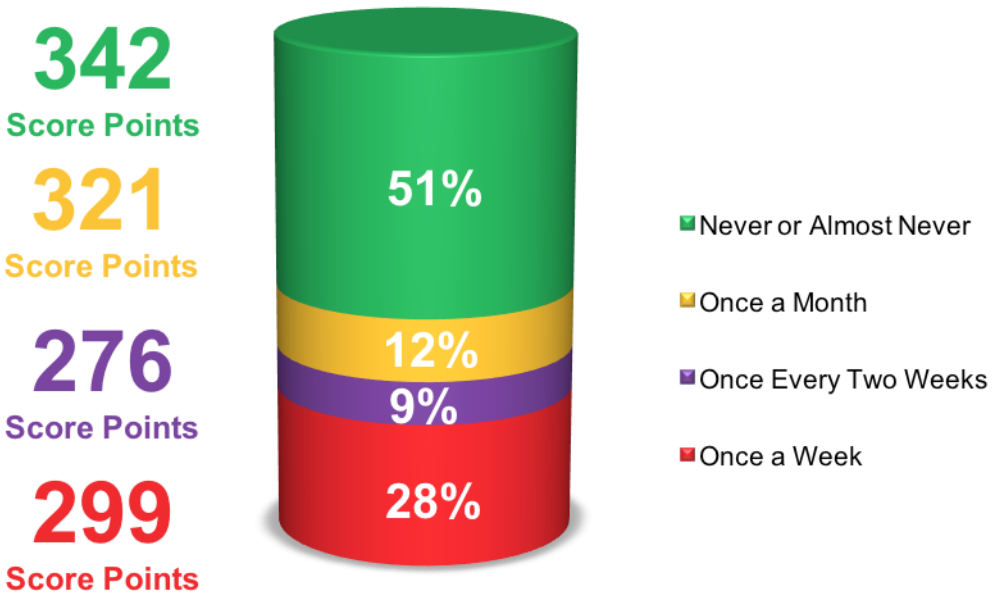


Figure 8.8: Learner Absenteeism and Learner Achievement

Internationally, 70% of learners were never or almost never absent from school, a greater proportion of learners than in South Africa. Furthermore, three times as many learners in South Africa (29%) were absent on a weekly basis compared to their international peers (9%).

Internationally, the frequency of being absent is related to lower average reading achievement and learners, who are frequently absent, score more than 60 points less than those who are not. South Africa follows a similar pattern with a difference of 43 points. The average reading achievement for Grade 4 learners who are *Never* or *Almost Never* absent from school was 342 (SE=5.2). In comparison, learners achieved a reading score of 276 (SE=5.8) if they were absent *Once Every Two Weeks*.

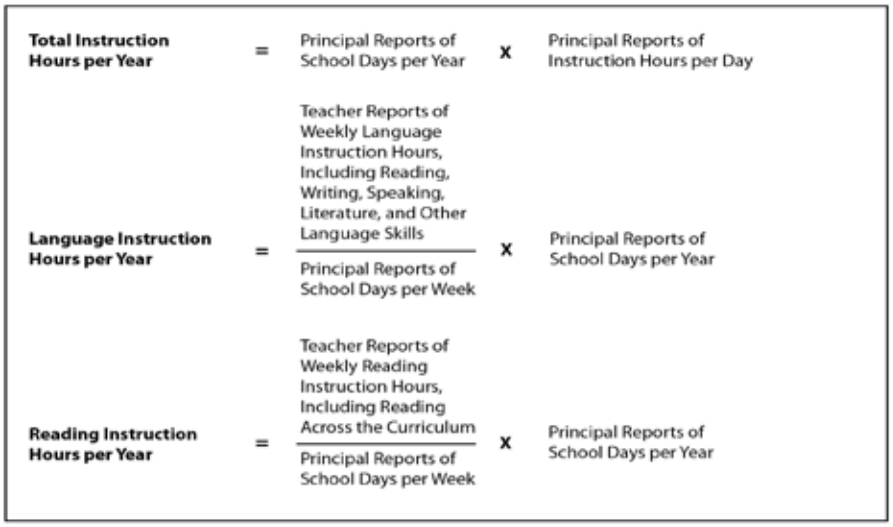
8.3.3 Instructional Time and Approaches

Opportunity to learn has been a key factor studied in many IEA studies (Howie, *in press*). Whilst many factors may influence the relationship between instructional time and achievement, including the quality of the instruction and the learning motivation and preparedness to learn, time on task (instructional time) is central. This section relates to teacher reports on instructional time spent on language and reading, as well as approaches or strategies used for enhancing learner reading skills.

8.3.3.1 Instructional Time

The current national curriculum document has clear guidelines for the language class. Reading instruction forms part of the language curriculum for the Intermediate Phase (Grades 4-6). For Home Language, the Curriculum and Assessment Policy Statement (CAPS) states that 6 hours should be spent per week and 5 hours for First Additional Language (FAL). Of the initial 6 hours spent on language in a week; however, only two and a half hours are allocated to reading (DBE, 2011).

Teachers reported on the amount of time spent on language and reading instruction. This information was combined with the data provided by school principals to estimate yearly amounts of instructional time, based on language and reading instruction per year. Below is an Information Box depicting how the estimations were calculated:



Information Box 2: Instructional Time Spent per Year

Internationally, on average, Grade 4 learners received 898 hours of instruction per year across all subjects. About 27% of that time was allocated to language instruction and 18% was dedicated to reading. South African teachers and principals reported that a total of 1 183 instructional hours is spent per year on all subjects.

Table 8.9 presents the number of hours per week spent on language and reading instruction on Grade 4 level, across countries, participating in PIRLS Literacy.

Table 8.9: Instructional Time Spent on Language and Reading

Country	Total Instruction Hours per Year All Subject	Language Instruction, Including Reading Writing, Speaking, Literature, and Other Language Skills		Reading Instruction, Including Reading Across the Curriculum	
		Hours per Year	Percent of Total Instruction Time	Hours Per Year	Percent of Total
South Africa	1 180 (16.7)	240 (14.3)	20 (1.3)	122 (8.0)	10 (0.6)
Denmark (3)	915 (12.9)	278 (4.0)	31 (0.5)	158 (11.2)	17 (1.2)
Egypt	924 (12.5)	297 (11.9)	34 (1.7)	161 (11.6)	18 (1.3)
Iran, Islamic Rep. of	627 (5.3)	143 (2.4)	23 (0.4)	124 (13.8)	20 (2.2)
Kuwairt	860 (19.9)	178 (126.5)	21 (2.0)	139 (13.8)	17 (1.5)
Morocco	1 036 (13.4)	224 (13.1)	21 (1.2)	109 (7.8)	11 (0.9)
International Average	898 (1.6)	242 (1.4)	27 (0.2)	156 (1.5)	18 (0.2)

Standard errors in parentheses.

In South Africa, of the 1 180 total hours spent on all subjects, 20% (240 hours) of these hours are spent on *Language Instruction* and 10% (122 hours) are spent on *Reading Instruction*. It is important to note that South Africa reported the most time spent on all subjects out of the 50 participating countries such as Egypt and Iran, whose teachers only spent 924 and 627 hours, respectively, on all subjects.

In contrast, all Eastern European and Scandinavian countries reported spending far less time overall on instruction, but a greater proportion of time on language, and a significantly higher proportion of time on reading. The top performing country in PIRLS, the Russian Federation, spent only 652 instructional hours per year but 41% was on language and 27% specifically on reading compared to South Africa's 20% on language and 10% on reading.

8.3.3.2 Teachers Develop Learner Reading Comprehension Skills and Strategies

Reading comprehension is crucial for successful reading progression. Research has found that even if only one reading comprehension strategy is taught, it can improve learner comprehension (Gill, 2008). Zimmerman (2010) found that comprehension skills and strategy instruction had not been sufficiently foregrounded in the South African curriculum, and that comprehension practices in the classroom were weak.

The following table displays the percentage of Grade 4 learners whose teachers were asked about the reading skills and strategies emphasised during reading instruction at least weekly. The table also indicates learner average achievement score per reading skill and strategy.

Table 8.10: Reading Skills and Strategies and Learner Achievement

	% of Learners whose teachers ask them to do the following at least weekly			
Reading Skills and Strategies	% of South African Learners	SE of %	% of International Learners	SE of %
Locate information within the text	93	1.8	96	0.2
Identify the main ideas of what they have read	96	1.4	94	0.2
Explain or support their understanding of what they have read	95	1.6	95	0.2
Compare what they have read with experiences they have had	91	2.0	83	0.4
Compare what they have read with other things they have read	89	2.1	75	0.4
Make predictions about what will happen next in the text	91	2.1	77	0.4
Make generalizations and draw inferences	87	2.3	82	0.4
Describe the style or structure of the text	87	2.3	69	0.4
Determine the author's perspective or intention	79	3.1	66	0.4

In comparison to learners internationally, a higher percentage of South African learners are exposed to *Compare what they have read with experiences they have had* as well as

make generalisations and draw inferences. Interestingly, 100% of learners in the Russian Federation are taught four of the strategies on a weekly basis and other strategies are taught to larger percentages of learners than in South Africa and internationally.

The least emphasis in South Africa, reflected by a smaller percentage (79%) of learners, is about *determining the author's perspective or intention*. Learner average achievement seems to be similar across the different reading skills and strategies.

8.3.4 Learner Readiness to Learn

Within these sections, the characteristics of the learners will be explored, as these affect learning and achievement. In this section, learner prerequisite knowledge and skills, nutrition and sleep are described.

8.3.4.1 Learner Prerequisite Knowledge and Skills

Research has shown a strong relationship between prior knowledge and attainment on large-scale assessments (Howie, 2002). Lack of the required knowledge and skills affects not only the individual learner's educational progress, but also class pace, depth of learning and general classroom atmosphere. Figure 8.9 shows the percentage of South African Grade 4 learners, as reported by their teachers, who have a lack of prerequisite knowledge and skills.

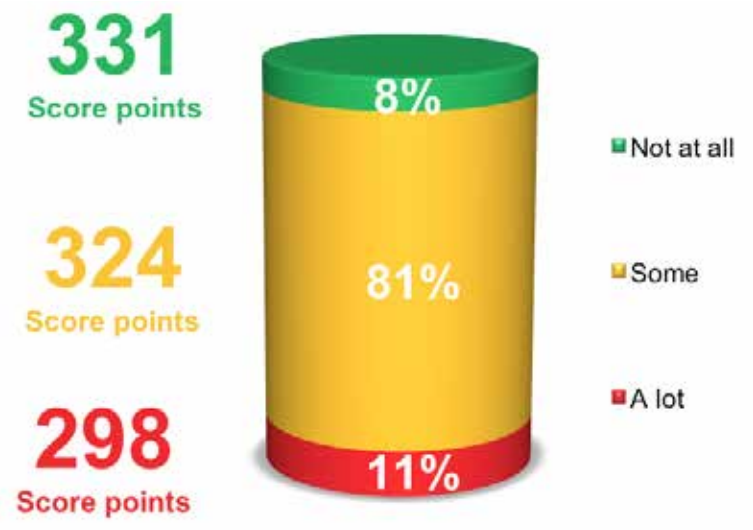


Figure 8.9: Learners who have Lack of Prerequisite Knowledge and Skills and Learner Achievement

The majority of Grade 4 teachers (81%) reported that learners, to some extent, lack the prerequisite knowledge and skills required to fully cope with the curriculum demand. This is substantially higher than their international peers (67%). Furthermore, more than one-fifth of classrooms internationally are not limited at all by the learners' lack of prerequisite knowledge and skills affecting their ability to cope, compared to only eight percent in South Africa.

This result could be one of the contributing factors to learner poor performance in the PIRLS Literacy assessments. A relationship can be observed where learners who, reportedly, do not have any lack in the prerequisite skills and strategies performed higher (331, SE=19.1)[30] than those who have a greater lack (298, SE=14.47) in these skills.

The next figure shows the percentage of learners who enter primary school with a lack of prerequisite knowledge and skills by language.

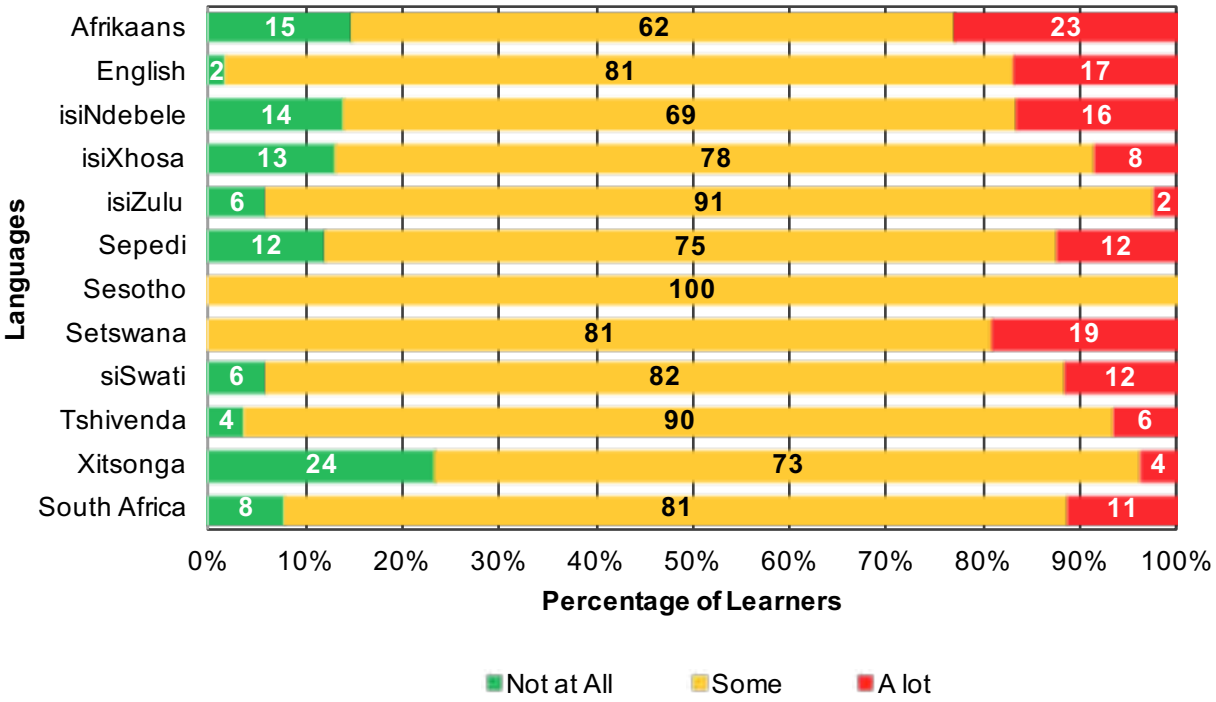


Figure 8.10: Learners who have Lack of Prerequisite Knowledge and Skills across Provinces

According to teacher reports on Grade 4 learners who enter school with a lack of prerequisite knowledge and skills, all of the learners who were tested in Sesotho had *some* lack of prerequisite knowledge and skills. The largest percent of learners who lacked a lot of prerequisite knowledge and skills were tested in Afrikaans (23%), followed by learners tested in Setswana (19%).

8.3.4.2 Learners Suffering from Lack of Nutrition and Sleep

Nutrition and sufficient sleep are two key contributing factors for a child's healthy development (see UNESCO, 2017). In South Africa, with 25% of the population living below the poverty line and having one of the highest inequality rates in the world, perpetuating both inequality and exclusion (Gini Coefficient 0.65 in 2014) (World Bank, 2017), many children go hungry and live in poor conditions. It has been found that nutrition and sleep result in better performance at school (see Lemma, Berhane, Worku, Gelaye, Williams, 2014 & Taras, 2005) or conversely the lack thereof has a negative impact on learner achievement (see Glewwe, Jacoby & King, 2001). Figure 8.11 shows the percentage of South African Grade 4 learners who arrive at school feeling hungry, as categorised by their teachers, and the associated mean scores.

[30] The Standard Error (SE) is large and seems to display much variation within the category.

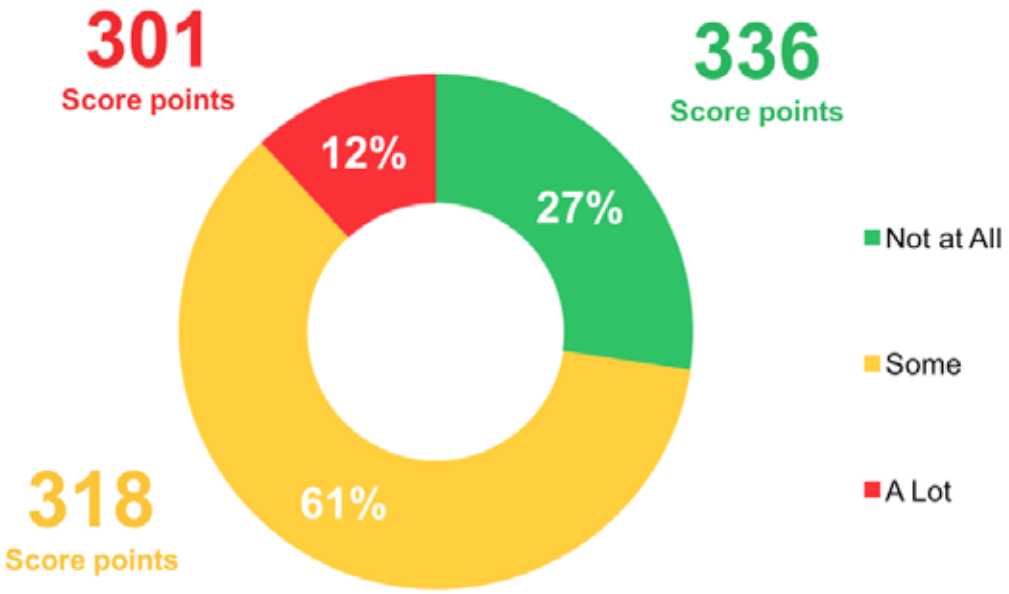


Figure 8.11: Lack of Nutrition and Learner Achievement

Less than one-third of learners internationally are in classes where teaching is limited due to learners suffering from a lack of nutrition. In contrast, teachers of nearly two-thirds (61%) of South Africa Grade 4 learners reported that they were limited in their teaching by children coming to school suffering from hunger. These learners achieved a mean score of 318 (SE=6.9) compared to 27% of learners who are not at all hungry (336, SE=9.9). There is an 18-point difference between the two groups.

The next figure shows the percentage of learners, in classes where teachers' instruction is limited by learners who suffer from a lack of nutrition, by province.

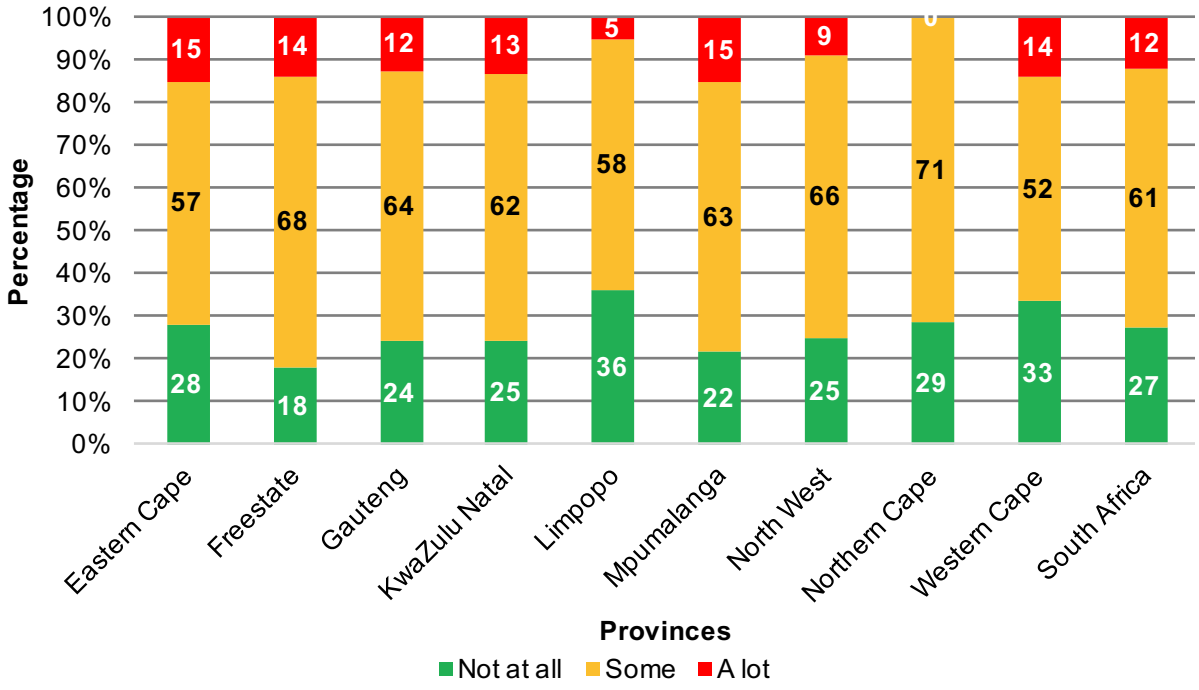


Figure 8.12: Teaching affected by Learners' Lack of Nutrition by Province

Across all the provinces, teachers indicated that their teaching was affected by Grade 4 learners suffering lack of nutrition. Interestingly, the highest percentage of learners with teachers not affected by learners' lack of nutrition were found in Limpopo. Learners in classes in the Eastern Cape and Mpumalanga appeared to have teachers most affected by learners' lack of nutrition.

Table 8.11 shows the proportion of South African Grade 4 learners, living in different residential areas[31], where teaching is limited by a lack of nutrition and their reading achievement.

Table 8.11: Teaching limited by Learners' Lack of Nutrition and Learner Achievement by Location

Area	Lack of Nutrition	% of Learners	SE of %	Mean Score	SE
Urban- densely populated	Not At All	47	11.7	435	26.9
	Some	45	11.1	365	20.5
	A Lot	8	8.0	315	5.8
Suburban- on fringe or outskirts of urban area	Not At All	33	13.8	332	24.2
	Some	59	13.5	441	22.1
	A Lot	8	4.5	274	65.0
Township near urban area	Not At All	24	6.1	325	14.4
	Some	60	8.5	304	13.3
	A Lot	16	6.7	318	10.3
Medium size city or large town	Not At All	31	27.2	467	7.0
	Some	69	27.2	390	61.2
	A Lot	~	~	~	~
Small town or village	Not At All	23	6.7	328	10.4
	Some	68	7.6	295	7.4
	A Lot	9	4.9	303	18.2
Remote rural	Not At All	27	5.0	279	8.9
	Some	61	6.8	297	5.7
	A Lot	12	5.2	292	18.8
South Africa	Not At All	27	3.1	336	9.9
	Some	61	3.4	318	6.9
	A Lot	12	2.9	301	8.7

A tilde (~) means insufficient data.

Overall, whilst there was no significant difference nationally across categories, in the disaggregated data by location there was a noted difference. In almost all areas, learners in classes *Not At All* affected had higher scores, except in notably suburban areas where *Some* classes were affected but achieved scores 100 points higher, indicating that somehow, despite teaching being limited by learners' lack of nutrition, learning was still accomplished.

In conjunction with the above, teachers also reported on learner sleep deprivation. Table 8.12 shows the percentage of South African Grade 4 learners whose teachers felt that their teaching was limited by learners' suffering from not enough sleep and their reading achievement by residential area[32].

[31] Note that the sampling was not done by residential area specifically. See Chapter 3 for further detail.
[32] Ibid.

Table 8.12: Teaching limited by Lack of Sleep and Learner Achievement by Location

Area	Lack Of Sleep	% of Learners	SE of %	Mean Score	SE
Urban- densely populated	Not At All	20	8.6	382	18.8
	Some	80	8.6	396	22.9
	A Lot	~	~	~	~
Suburban- on fringe or outskirts of urban area	Not At All	34	13.2	430	43.9
	Some	58	15.7	372	35.8
	A Lot	8	8.5	376	1.8
Township near urban area	Not At All	31	8.6	293	23.5
	Some	62	7.8	318	7.6
	A Lot	7	3.8	331	11.7
Medium size city or large town	Not At All	50	25.9	395	95.5
	Some	50	25.9	433	64.0
	A Lot	~	~	~	~
Small town or village	Not At All	29	7.7	300	12.1
	Some	64	7.9	306	8.3
	A Lot	7	4.5	299	21.1
Remote rural	Not At All	48	5.9	285	7.4
	Some	50	5.9	297	6.4
	A Lot	2	1.0	299	34.8
South Africa	Not At All	35	3.2	314	7.5
	Some	59	3.5	325	6.9
	A Lot	5	1.6	324	12.2

A tilde (~) means insufficient data.

Almost half of teachers (45%) internationally felt that sleep deprivation was not at all a limitation factor for their teaching. However, it seemed to be more of a limitation in South African classes where 64% of learners were affected by this to some extent. Learners in densely populated areas seemed to be most affected.

Internationally there appeared to be an association with achievement with learners *Not Affected* achieving the highest scores. In South Africa, the association was not consistent across areas or nationally. Only in Suburban areas was the association similar to that found internationally.

It appears that learners, as reported by their teachers, who arrive at school feeling *Not at all* tired had a reading achievement score of 314 (SE=7.5) compared to learners who are *Somewhat* tired, who achieved a slightly higher score of 325 (SE=6.9).

8.3.5 Classroom Resources for Teaching Reading

Having access to and utilising a variety of resources is a critical aspect of teaching particularly with enhancing the reading skills of Grade 4 children. The richness of the reading resources in the classroom is crucial for learner reading literacy development. A variety of resources could be used in the classroom; for example, children's books, posters, comic strips, newspapers and more recently, reading resources on the computer. If learners have the opportunity and regular access to books in the classroom library, they tend to have a more positive attitude towards reading (Mullis & Martin, 2015).

8.3.5.1 Types of Texts Used in Classrooms

Utilising a variety of reading resources enables the teacher to enhance the teaching and learning of reading literacy skills. The PIRLS *Teacher Questionnaire* asked teachers how frequently they used different types of literary and informational texts as these were the two purposes assessed in PIRLS Literacy. Previously children's books were a very popular choice in PIRLS 2011 (see Howie et al., 2012).

Table 8.13 shows information about the different literary texts teachers used in the classroom. Both nationally (87%) and internationally (78%) *Short Stories* were the most popular type of literary text assigned on a weekly basis. Internationally when these and longer fiction books were assigned weekly, learners achieved higher scores compared to those who were not. It is notable that when these types of literary texts are used *Less than Once a Week* learners in South African classes seem to achieve higher mean scores. However, it is not clear why South African learners do better when these texts are assigned less often.

Table 8.13: Teachers utilise Literary Texts for Reading Instruction and Learner Achievement

Country	Short Stories				Longer Fiction Books with Chapters				Plays			
	Once a Week or More		Less than Once a Week		Once a Week or More		Less than Once a Week		Once a Week or More		Less than Once a Week	
	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score
Denmark (3)	77	503	23	496	57	504	43	497	1	22	99	501
Egypt	56	328	44	334	12	324	88	331	10	354	90	327
Finland	72	565	28	569	50	566	50	567	2	~	98	566
Hong Kong SAR	55	570	45	567	8	573	92	568	3	567	97	569
Iran,Islamic Rep.of	60	434	40	418	24	427	76	428	10	430	90	431
Ireland	88	567	12	565	76	564	24	575	1	~	99	567
Kuwait	67	392	33	395	25	397	75	391	11	369	89	396
Morocco	42	361	58	355	11	360	89	356	8	335	92	360
Russian Federation	90	582	10	569	61	584	39	575	6	596	94	580
Singapore	75	577	25	572	35	594	65	567	3	590	97	576
South Africa	87	318	13	350	39	302	61	335	45	295	55	344
International	78	512	22	508	41	516	59	508	9	501	91	512

A tilde (~) means insufficient data.

The next table shows the type of literary texts used by teachers for reading instruction and their associated learner achievement by province.

Table 8.14: Teachers utilise Literary Texts for Reading Instruction and Learner Achievement across Provinces

Province	Short Stories				Longer Fiction Books with Chapters				Plays			
	Once a Week or More		Less than Once a Week		Once a Week or More		Less than Once a Week		Once a Week or More		Less than Once a Week	
	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score
Eastern Cape	87	288	13	286	50	259	50	302	49	241	51	333
Free State	88	332	12	467	39	332	61	360	46	324	54	371
Gauteng	95	343	5	514	32	335	68	371	44	296	56	397
KwaZulu Natal	86	310	14	355	34	308	66	321	53	303	47	332
Limpopo	84	287	16	280	44	283	56	290	33	295	67	282
Mpumalanga	87	317	13	313	51	301	49	332	60	305	40	333
North West	74	316	26	361	25	297	75	340	43	305	57	348
Northern Cape	99	316	1	366	41	324	59	313	39	326	61	311
Western Cape	87	369	13	434	33	358	67	387	32	352	68	391
South Africa	87	318	13	350	39	302	61	335	45	295	55	344
International Average	78	512	22	508	41	516	59	508	9	501	91	512

Almost all (99%) of the learners in the Northern Cape were in classes where teachers indicated that their favourite type of literary text to use weekly is *Short Stories.* However, the learners seem to achieve a higher mean score if the teachers use *Short Stories* less than once a week. Learners in the Western Cape achieved a higher mean score if their teacher used *Plays* less than once a week (391, SE=13.7) than on a weekly basis (352, SE=8.3).

The next table presents information about the informational texts used during teaching. The most popular choice, nationally (73%) and internationally (71%), for reading instruction with regards to informational texts is *Non-Fiction Subject Area Books*.

Table 8.15: Teachers utilise Informational Texts for Reading Instruction and Learner Achievement

Country	Non-fiction Subject Area Books				Longer Non-fiction Books with Chapters				Non-fiction Articles			
	Once a Week or More		Less than Once a Week		Once a Week or More		Less than Once a Week		Once a Week or More		Less than Once a Week	
	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score
Denmark (3)	56	499	44	503	13	504	87	501	20	496	80	502
Egypt	60	329	40	334	18	308	82	335	30	337	70	327
Finland	93	567	7	562	11	569	89	566	14	564	86	567
Hong Kong SAR	45	568	55	570	10	560	90	570	37	564	63	571
Iran, Islamic Rep. of	52	432	48	424	22	417	78	432	26	429	74	428
Ireland	83	565	17	572	33	565	67	567	37	568	63	566
Kuwait	67	388	33	402	23	404	77	389	34	402	66	387
Morocco	57	367	43	345	15	353	85	358	15	375	85	354
Russian Federation	75	585	25	567	32	594	68	574	38	590	62	575
Singapore	59	576	41	577	21	579	79	576	45	584	55	570
South Africa	73	318	27	323	40	313	60	326	69	313	31	334
International Average	71	512	29	508	24	513	76	510	39	513	61	510

Again South African contradicts the international pattern of higher achievement associated with weekly assignments. South African learners achieve higher reading scores when teachers use non-fiction subject area books *Less than Once a Week*, 323 points (SE=9.0) and longer non-fiction books *Less than Once a Week* (326, SE=6.4) compared to those who use them *Once a Week or More* (313, SE=7.3). Overall, South African teachers seem to use non-fiction subject area books and non-fiction articles more often than longer non-fiction books with chapters. Furthermore, South African learners were apparently assigned non-fiction article weekly, more so than their peers internationally.

The next table shows the informational texts the teachers used for reading instruction across provinces.

Table 8.16: Teachers utilise Informational Texts for Reading Instruction across Provinces

Province	Non-fiction Subject Area Books				Longer Non-fiction Books with Chapters				Non-fiction Articles			
	Once a Week or More		Less than Once a Week		Once a Week or More		Less than Once a Week		Once a Week or More		Less than Once a Week	
	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score	% of Learners	Mean Score
Eastern Cape	67	276	33	307	53	290	47	283	76	278	24	315
Free State	80	357	20	323	55	366	45	334	49	371	51	333
Gauteng	75	339	25	361	25	370	75	348	67	314	33	406
KwaZulu Natal	76	316	24	319	41	306	59	324	76	313	24	326
Limpopo	73	285	27	290	41	280	59	291	59	288	41	285
Mpumalanga	85	305	15	335	48	295	52	323	70	305	30	341
North West	60	339	40	311	27	305	73	337	54	342	46	312
Northern Cape	87	324	13	270	25	319	75	317	66	333	34	286
Western Cape	73	378	27	363	41	358	59	387	81	366	19	407
South Africa	73	318	27	323	40	313	60	326	69	313	31	334
International Average	71	512	29	508	24	513	76	510	39	513	61	510

The majority (80%) of learners in the Free State had teachers who used non-fiction subject area books on a weekly basis. The learners from the Free State achieved an average reading score of 357 (SE=20.2) compared to those learners (323, SE=12.9) whose teachers only used non-fiction subject area books *Less Than Once a Week*. The learners in Gauteng achieved a 92-point higher mean score if their teacher used non-fiction articles *Less Than Once a Week* compared to those who use it at least weekly.

8.3.5.2 Classroom Libraries

The purpose of classroom libraries differs from school libraries. Having books and magazines in the class, as part of the lesson and activities, provide easier access. However, they may not provide sufficient enrichment and choice that the size and variety of reading levels that a school library can provide. Classroom libraries should have a variety of different types of materials to assist in learner reading comprehension development.

Internationally, 72% of learners have a classroom library. A third of learners have more than 50 books and more than half are given class time to use the library weekly, borrow books and two-thirds are taken to another library monthly.

However, in South Africa only 54% of South African Grade 4 learners have a classroom library and only a quarter have 50 books or more. Nearly half of learners are given class time to use the classroom library weekly. Forty-one percent can borrow books from that library. Just over half of learners are taken to other libraries (including school library) monthly. Table 8.17 shows the learner average achievement score if there is a classroom library available per province.

Table 8.17: Availability of Classroom Library and Learner Achievement

Province	Classroom Library Availability	% of Learners	SE of %	Mean Score	SE
Eastern Cape	Yes	35	8.7	278	31.7
	No	65	8.7	292	21.2
Free State	Yes	28	11.7	333	11.0
	No	72	11.7	353	21.0
Gauteng	Yes	60	9.6	361	33.2
	No	40	9.6	331	27.6
KwaZulu Natal	Yes	71	11.1	324	10.7
	No	29	11.1	298	16.3
Limpopo	Yes	44	10.8	296	6.2
	No	56	10.8	278	6.8
Mpumalanga	Yes	41	10.2	303	17.5
	No	59	10.2	318	9.4
North West	Yes	38	13.2	349	39.5
	No	62	13.2	318	8.3
Northern Cape	Yes	59	11.3	297	11.8
	No	41	11.3	346	22.9
Western Cape	Yes	93	5.5	384	9.1
	No	7	5.5	322	121.7
South Africa	Yes	54	3.8	332	8.2
	No	46	3.8	308	6.9

Across the provinces, there is a wide variation in the provisioning of classroom libraries in Grade 4. Whilst only 28% of learners in the Free State have a classroom library, 93% of learners in the Western Cape do have one.

Internationally and nationally, learners in schools with classroom libraries achieve higher scores with the difference being 25 points. But, there is not a consistent pattern across provinces. Five provinces follow the international and national trend of higher performance (Gauteng, KwaZulu Natal, Limpopo, North West and Western Cape). However, with the exception of possibly Limpopo, it is unlikely that the achievement is significantly different.

Overall in South Africa, there does not seem to be a direct relationship between having a classroom library and learner average achievement. Learner reading scores are slightly higher (332, SE=8.2) when there is library in the classroom compared to when there is not a classroom library in place (308, SE=6.9). However, in a few provinces, it appears that when there is not a classroom library in place, learner achievement is somewhat higher than where libraries are established in classrooms. For example, in both the Eastern Cape and Free State provinces, learners achieved higher scores even if the classroom does not have a library.

8.3.5.3 Instruction for Online Reading

In the Second International Technology in Education Study 2006, only 38% of South African schools were found to have ICT available for pedagogy at secondary school level (Howie & Blignaut, 2009) with fewer primary schools than secondary schools having ICT. Amongst other general reading skills, learners need to become equipped with ICT-related additional skills (Coiro, 2003) in order to successfully access information from the Internet (Leu et al., 2007).

Internationally, almost half of Grade 4 learners have access to computers to use for reading lessons at school, although only 10% have a computer for each learner. Only 10 countries in the study have two-thirds of their learners or more having computers available for reading lessons.

South Africa has one of the lowest rates of access to computers (8%) in the study with only Belgium (French) at 7% and Morocco at 6% having fewer learners with access. Very few South African Grade 4 learners have access to school computers or tablets for reading or as part of their reading lessons, as reported by teachers (see Table 8.18).

Table 8.18: Access to School Computers for Reading Lessons and Learner Achievement by Province

Province	Tablet/ Computer Availability	% of Learners	SE of %	Mean Score	SE
Eastern Cape	Yes	4	4.2	467	7.0
	No	96	4.2	275	15.2
Free State	Yes	17	6.0	340	7.8
	No	83	6.0	348	17.5
Gauteng	Yes	9	6.5	495	20.0
	No	91	6.5	336	19.9
KwaZulu Natal	Yes	6	4.5	370	81.9
	No	94	4.5	313	8.4
Limpopo	Yes	10	1.5	259	9.6
	No	90	1.5	289	5.4
Mpumalanga	Yes	~	~	~	~
	No	100	0.0	313	9.9
North West	Yes	9	6.6	328	6.0
	No	91	6.6	327	15.9
Northern Cape	Yes	22	10.7	363	24.9
	No	78	10.7	304	10.4
Western Cape	Yes	16	4.0	357	15.5
	No	84	4.0	381	12.1
South Africa	Yes	8	1.6	372	20.0
	No	92	1.6	316	5.3

A tilde (~) means insufficient data.

Internationally, there is a relationship between access to computers and achievement. In South Africa, it is stronger and represents a difference of 56 points and is probably related to higher socio-economic status of the composition of the school. In general, when South African learners have access to computers at school for reading lessons or instructions, their average reading achievement is 372 (SE=20.0)[33] compared to those who do not have access (316, SE=5.3).

Across the provinces, access ranges greatly from no access (0%) in Mpumalanga to 22% in the Northern Cape. It is notable that teachers from Mpumalanga indicated that none of the learners have access to a computer or tablet for their reading lessons. It seems that learners from the Northern Cape (22%) have the most access to computers or tablets for their reading lessons followed by learners from the Free State (17%) and Western Cape (16%). Low percentages were found in the Eastern Cape, KwaZulu Natal, Gauteng and North West.

[33] The Standard Error (SE) is large and seems to have great variation within the category.

In some provinces the difference in achievement is vast, up to almost 200-point difference in the Eastern Cape, whilst in others there appeared to be a negative relationship.

Table 8.19 depicts information about the availability of school computers per learner in South Africa. Of the eight percent of learners (see Table 8.18) in schools that reported having ICT available for reading lessons, only seven percent have access to computers and tablets for each learner. However, some schools might have computers in classrooms as well as a computer room that the learners might use.

Table 8.19: Access to School Computers for Reading Lessons per Learner and Learner Achievement

Computer Availability		% of learners	SE of %	Mean Score	SE
Each learner has a computer	Yes	7	5.9	379	62.4
	No	93	5.9	374	21.5
The class has computers that learners can share	Yes	18	9.4	418	43.5
	No	82	9.4	364	22.8
The school has computers that the class can use	Yes	72	7.8	409	20.3
	No	28	7.8	284	18.0

There appears to be a direct association between access to a computer or tablet for reading lessons and learner achievement. If there are computers available but not for every learner, learner achievement is somewhat higher than for those who do not have access. The largest differences were found where computers were available in the school for class use, learners achieved a mean score of 409 (SE=20.3) compared to 284 (SE=18.0) where they were not.

8.4 Conclusion

This chapter presented the findings of the classroom-related factors. Almost half of the teachers who participated in the PIRLS Literacy study had completed a post-secondary education qualification (e.g. diploma), closely followed by teachers who had completed a Bachelor's Degree. Only 1 percent of learners were taught by teachers who had not completed Grade 12. Almost half (49%) of the Grade 4 learners were taught by teachers who were aged between 40 and 49. However, learners who were taught by teachers between the ages of 30 and 39 achieved on average 62 points higher than those taught by teachers between the ages of 40 and 49.

Most of the teachers had reported that they are very satisfied with their profession. The learners taught by teachers with positive dispositions towards their career scored on average 28 points higher than those learners who were taught by teachers who were somewhat satisfied with their careers.

More than half of the Grade 4 learners indicated that they like reading and achieved higher scores than their peers. Additionally, just over half of the learners reported that they are never or almost never absent from school. These learners scored 42 points higher than those who were absent once a week.

For PIRLS Literacy, teachers indicated that they spent a total of 18% of their total instruction on language instruction which includes reading, writing, speaking, literature and other language skills. The teachers also reported that about 12% of their instructional time is devoted to reading instruction. Teachers were also asked to report on the type of literary and informational texts used in the classroom. Short stories and non-fiction subject area books were the most popular type of literary and informational text, respectively, among teachers.

The study also found that very few of the Grade 4 learners do not have a lack of prerequisite knowledge and skills. It would appear that the majority of learners have, to some extent, a lack of prerequisite knowledge.

Overall, almost two-thirds of the Grade 4 learners suffer from some lack of nutrition. These learners achieved 18 points lower than those who do not lack nutrition. In conjunction with the aforementioned, most of the Grade 4 learners go to school feeling somewhat tired.


PIRLS
2016

CHAPTER 9: EXPLORING THE HOME ENVIRONMENT OF PIRLS LITERACY 2016 LEARNERS

Karen Roux and Sarah Howie

9.1 Introduction

This chapter describes the home environment of the learners tested in PIRLS 2016. Research, both nationally and internationally, has found that the home environment plays a vital role in learner reading literacy development (see Howie et al., 2012; Mullis et al., 2012; McLeod Palane, *in press*; Roux, 2014) and therefore plays a prominent part in the conceptual framework for the design of PIRLS 2016. A supportive and constructive home environment fosters positive attitudes towards reading, which may, in turn, lead to higher learner reading literacy achievement (Mullis, Martin, Foy & Drucker, 2012).

The chapter comprises two sections, namely Learner Factors (9.2) and the Home Environment (9.3). The first section focuses on individual learner attitudes towards reading, motivation for reading as well as confidence in reading. The next section will explore the different aspects of the home environment as it encapsulates home resources, parents' education levels, early literacy activities and early literacy skills of learners.

This chapter will give an overall view of South African learners home backgrounds and the importance of having a strong reading literacy foundation and support from parents to enable learners to attain higher levels of reading comprehension.

9.2 Learner Factors

South African Grade 4 learners who participated in the PIRLS Literacy study were amongst the oldest in the study internationally, as the average age of the learners was 10.6 years compared to 10.2 years internationally. Less than half (48%) of the learners were girls. In Chapter 2, the multilingual context and the language in education policy were discussed as these aspects result in a complex environment for teaching and learning. In PIRLS Literacy 2016, 66% of the learners (always) spoke the language of the test at home (see Chapter 4) which compares to 65% in PIRLS 2011 and 62% in PIRLS 2006, indicating that more learners are speaking the language of the test at home compared to a decade ago.

A profile of the South African Grade 4 PIRLS Literacy learners is presented in Figure 9.1. The largest percentage of learners were represented in KwaZulu Natal (21%), Eastern Cape (18%) and Gauteng (17%). The average class size was 45 learners per Grade 4 class in South Africa. The learners writing in English, followed by those writing in isiZulu, were the two test languages with the largest representation. Approximately 71% of the sample spoke the language of the test as a home language. Most of the learners came from rural areas (39%)

and small towns or villages (20%). Principals reported that as many as 75% of learners came from economically disadvantaged backgrounds. A breakdown of language per province can be seen in Appendix A, but analysis of reading achievement of languages within provinces is not recommended as sample sizes become small and standard errors increase. The average age of learners sampled was similar across provinces and different language groups (ranging from 10.4 to 10.9).

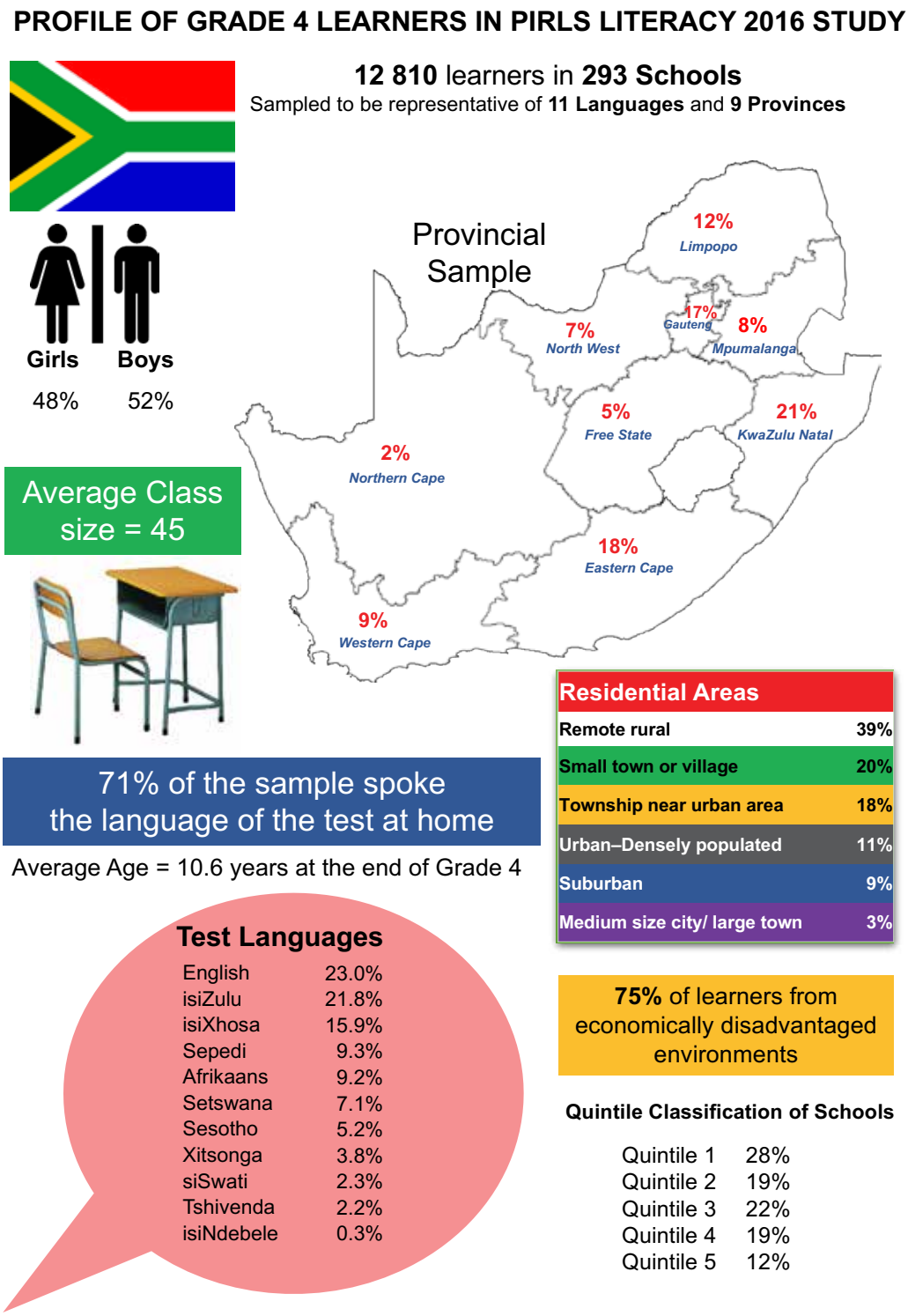
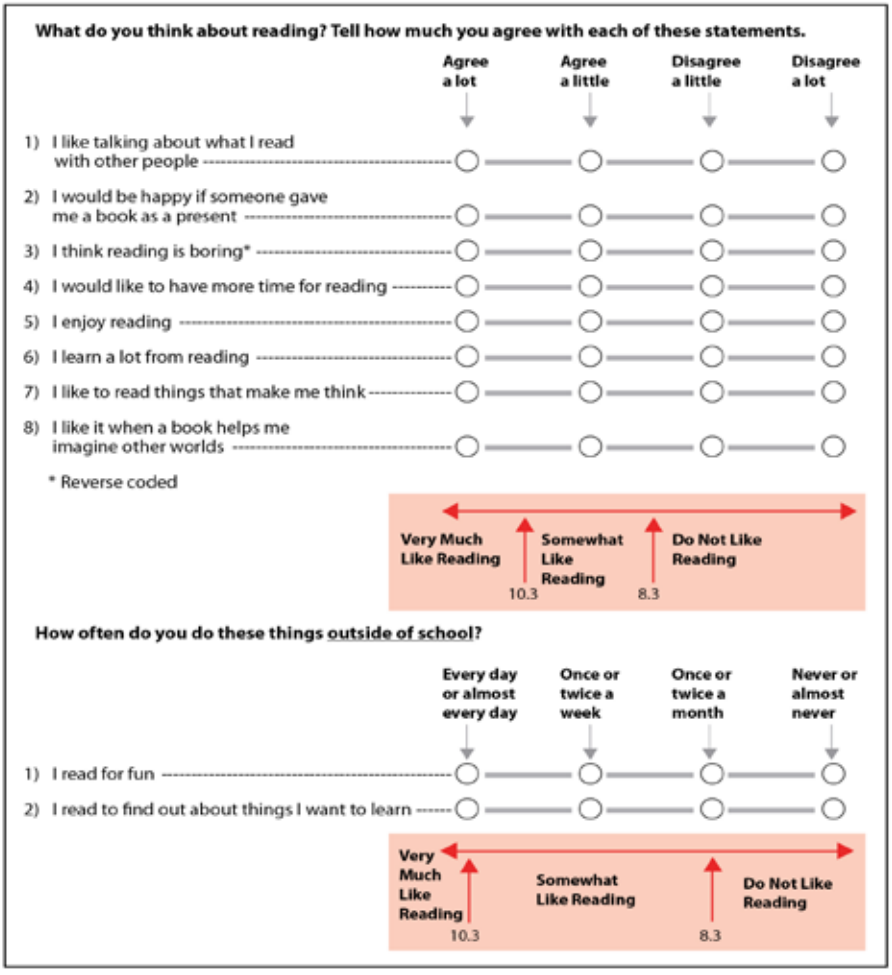


Figure 9.1: Profile of the South African Grade 4 PIRLS Literacy Learners

In the next section, learner attitude and confidence in their reading ability are described.

9.2.1 Learners Enjoy Reading

Grade 4 learners were asked to indicate to what extent they enjoy reading. They were asked a few questions about how much they agree to specific statements about reading. The Students Like Reading scale was created based on learner response. The responses were divided into three categories, *Very Much Like Reading, Somewhat Like Reading* and *Do Not Like Reading*. The information box below shows how the scale was created:



Information Box 1: Students Like Reading Scale

Figure 9.2 presents the percentage of Grade 4 learners who liked reading and their associated reading achievement. Only 9% of learners reported *Do Not Like Reading*. There is a direct, positive association between enjoying reading and reading achievement.

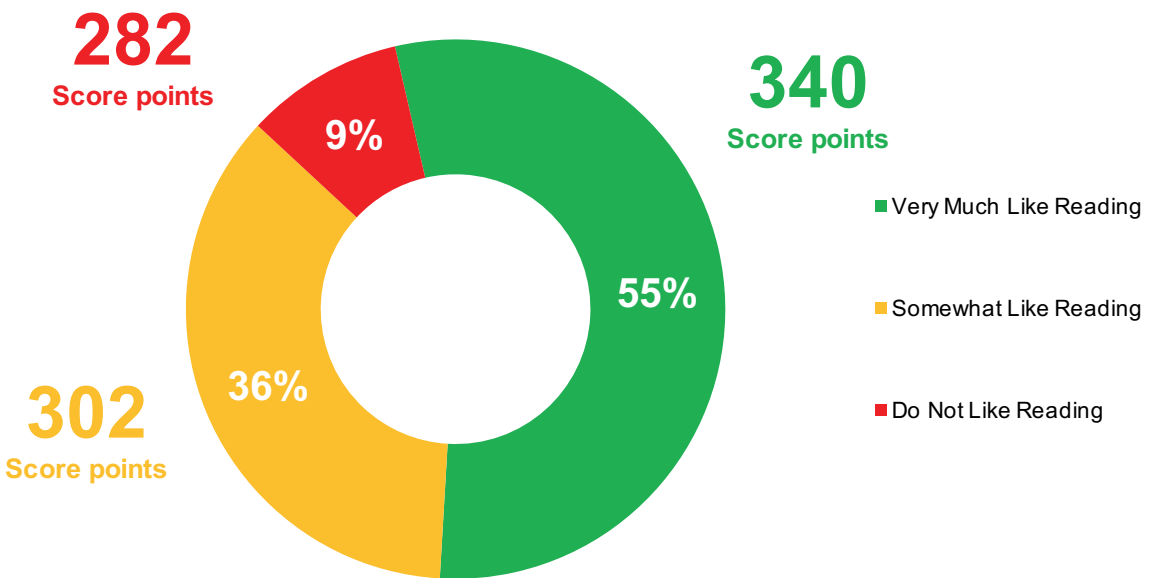


Figure 9.2: Grade 4 Learners who Like Reading and Learner Achievement

Internationally, 43% of learners *Very Much Like Reading*; however, a greater percentage (55%) of learners in South Africa reported that they *Very Much Like Reading* and they were the highest achieving group that achieved a reading score of 340 (SE=3.7) compared to a low percentage of learners (9%) who *Do Not Like Reading* (282, SE=9.1), a 58-point difference, which was significantly lower[34]. This was similar to the international findings.

Figure 9.3 presents the percentage of Grade 4 learners by the different language groupings and how much they like to read.

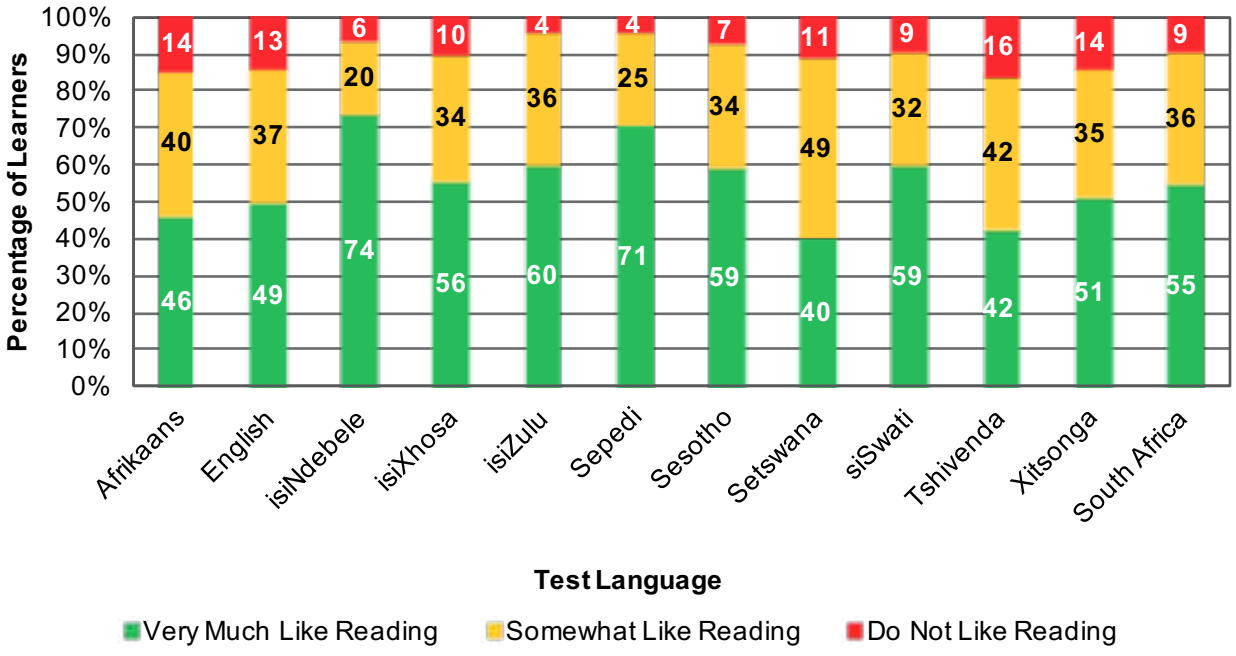


Figure 9.3: Grade 4 Learners who Like Reading by Test Language

[34] The point difference was statistically significant as the t-value is -7.68 (p<.05).

Learners *Very Much Liked Reading* across most languages. The exceptions were Setswana where the largest group *Somewhat Liked Reading* and in Tshivenda, where equal percentages *Very Much Liked* and *Somewhat Liked Reading*.

The highest percentage of learners from the 11 languages who *Very Much Like Reading* was learners tested in isiNdebele (74%), followed by learners tested in Sepedi (71%). As expected, learner reading achievement was the highest across the 11 languages when learners indicated that they *Like Reading*.

The next figure shows the Grade 4 learner average reading score per *Like Reading* category by language.

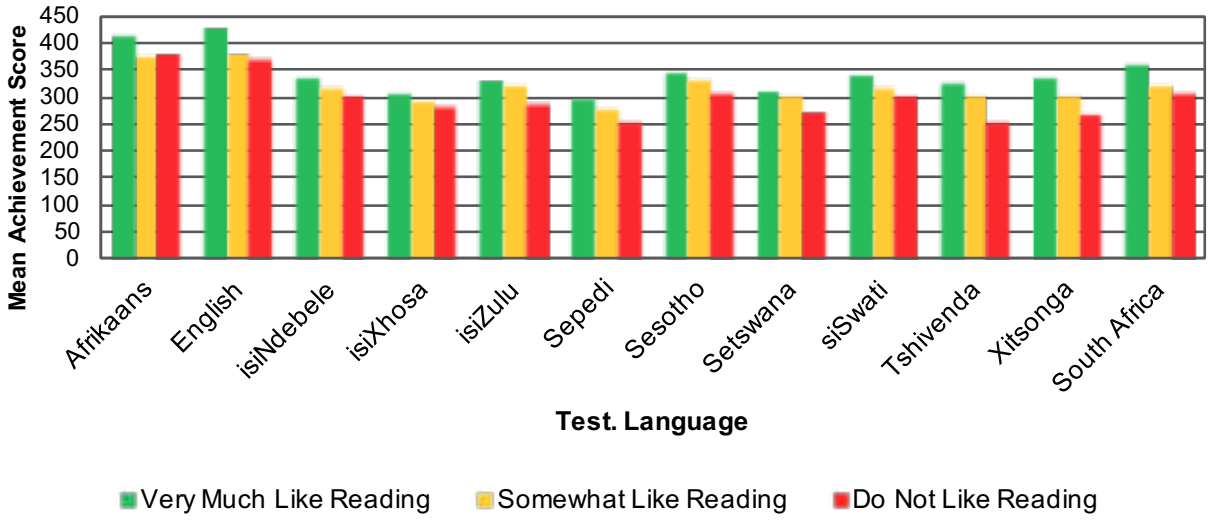


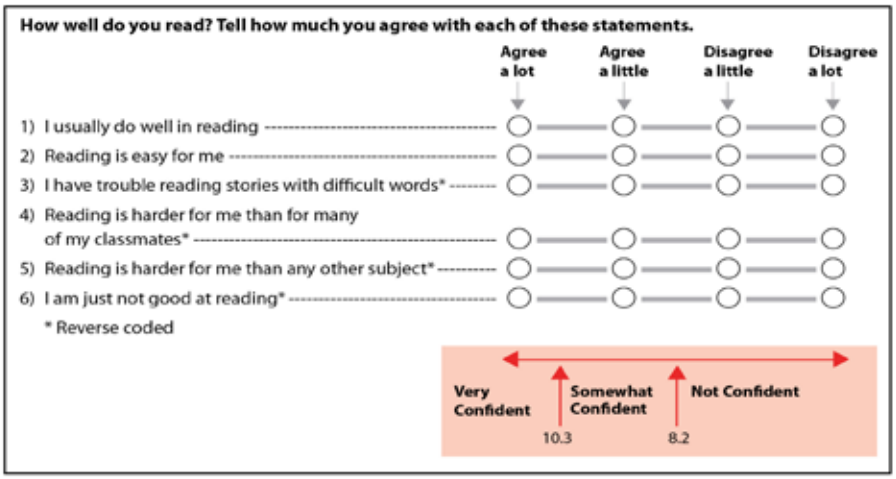
Figure 9.4: Grade 4 Learners who Like Reading and Learner Achievement by Test Language

Overall most (51%) South African learners who *Very Much Like Reading* achieved a score of 340 (SE=3.7) followed by learners who *Do Not Like Reading* (282, SE=9.1). The largest point difference was in Xitsonga (100 points) between *Very Much Like Reading* and *Do Not Like Reading*[35]. The smallest point difference (27 points) is in Afrikaans when looking at *Very Much Like Reading* and *Do Not Like Reading*.

9.2.2 Learner Confidence in Reading

Irrespective of whether learners enjoy reading and are motivated to read, learner confidence in their reading ability is based on their past experience (Thomson, Hillman, Wernert, Schmid, Buckley & Munene, 2012). In PIRLS Literacy 2016, learner confidence in their reading ability was measured by statements such as I usually do well in reading and reading is easy for me (see Information Box 2). The Students Confident in Reading scale comprises three categories, namely *Very Confident*, *Somewhat Confident* and *Not Confident*. Learner responses on the above statements were converted to one of these categories. See the box below for a depiction of how the scale was created:

[35] The point difference was statistically significant as the t-value is -7.57 ($p<.05$).



Information Box 2: Learner Confidence in Reading Scale

Internationally, 45% of the learners were *Very Confident* whereas South Africa had the smallest percentage of *Very Confident* learners (20%) of all who participated in PIRLS Literacy, which is very telling given the low achievement of South African learners. Just less than half (47%) South African learners indicated that they were *Not Confident* in their reading skills and abilities and there was a 90-point gap between the *Very Confident* and *Not Confident* groups. Figure 9.5 presents the percentage of learners in each category per language.

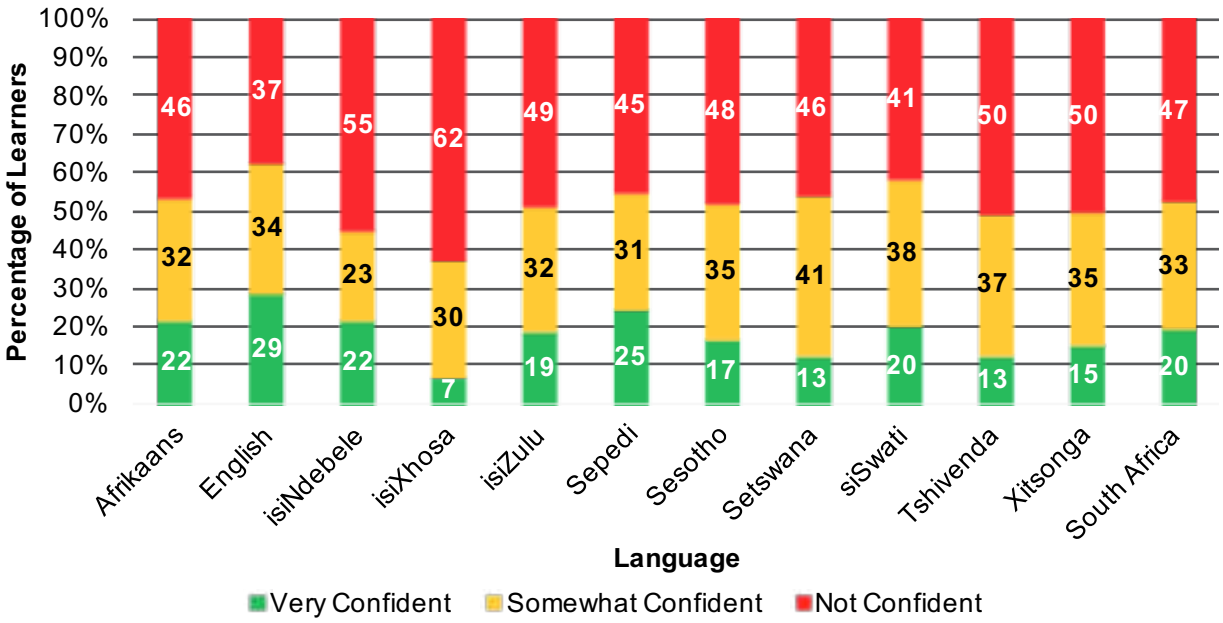


Figure 9.5: Grade 4 Learners and Confidence in Reading by Test Language

Universally the largest group in each language responded that they were *Not Confident*. This varied from 37% in English to 62% in isiXhosa. The most *Confident* group were those tested in English (29%). These responses were consistent with how learners performed in these languages (see Chapter 4). Learners filled in the questionnaires after they had completed the assessment, and given the low performance nationally, this may have had an impact on learner responses. Figure 9.6 presents learner reading literacy mean score per category by test language.

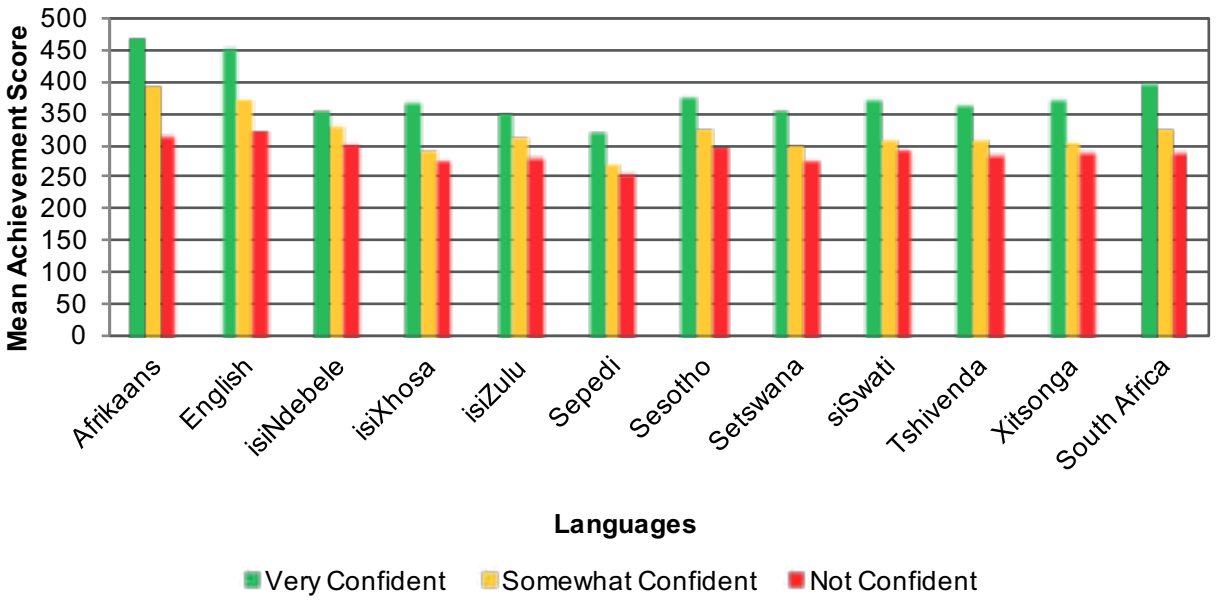


Figure 9.6: Grade 4 Learner Achievement and Confidence in Reading by Test Language

There is a positive relationship between learner reading confidence and reading literacy achievement. Across all languages the most confident learners achieved the highest scores. Without exception, the difference between the most confident and least confident groups exceeds 50 points with the smallest difference being 59 points (one year of schooling) and the largest difference being 157 points in Afrikaans (the equivalence of about four years of education). The most confident learners were those who wrote the assessment in English. The English learners who were very confident in reading scored 453 points (SE=11.2) compared to those who were not confident (322, SE=13.7).

9.3 The Home Environment

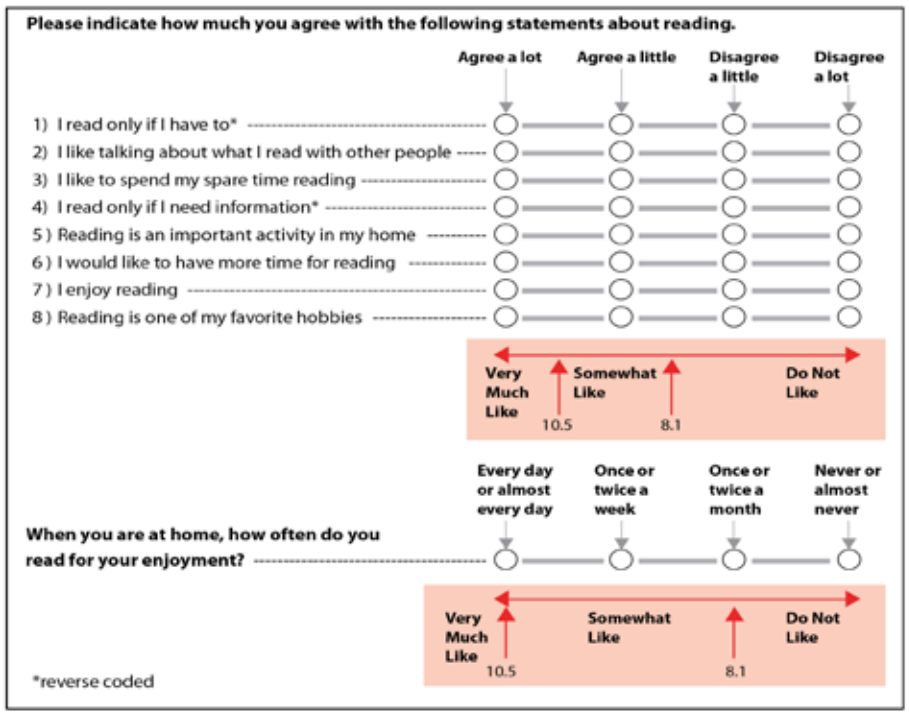
In this report, the Home Environment encapsulates three different aspects at the home level. These include Parental Factors (9.3.1), Early Literacy Experiences in the Home (9.3.2) as well as Educational Resources in the Home (9.3.3). Parental factors include aspects such as Parents Enjoy Reading and Conversations about Homework. This is followed by the type of literacy activities used before beginning primary school, type of tasks learners performed and preschool attendance of learners. The last section focuses on the availability of educational resources in the home, one of the most important factors relating to learner reading literacy (McLeod Palane, *in press*; Roux, 2014).

9.3.1 Parental Factors

The PIRLS Literacy *Parent Questionnaire* sought information about parental reading habits (9.3.1.1), whether they, as parents, conducted conversations with their child about school work (9.3.1.2) and finally their educational aspirations for their child (9.3.1.3).

9.3.1.1 Parents Enjoy Reading

Parents are one of the first sources for children to learn and appreciate reading and reading materials. Children may start modelling their parents' reading behaviours which in turn is likely to increase their language performance (Kloostermann, Notten, Tolsma & Kraaykamp, 2010). The Parents Like Reading (PLR) scale was created based upon parental responses to eight statements about reading as well as how often they read for their own enjoyment and their attitude to reading (see Information Box 3).



Information Box 3: Parents Like Reading Scale

Figure 9.7 presents the percentage of learners' parents who enjoy reading and the associated learner reading literacy score.

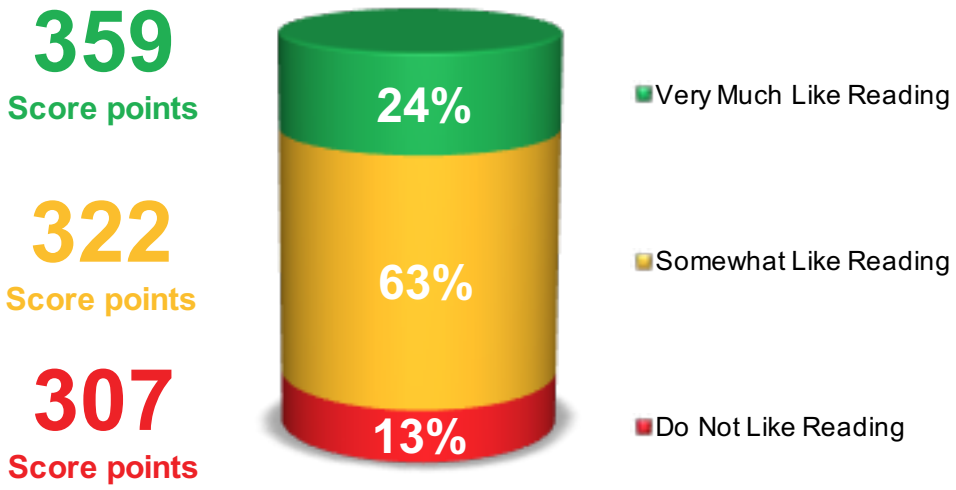


Figure 9.7: Learners' Parents Enjoy Reading and Learner Achievement

The parental responses are contrary to the children who were more positive towards reading. Only 31% of learners' parents internationally *Very Much Like Reading* and the largest group (51%) *Somewhat Like Reading*. South Africa followed the international pattern as most (63%) of the learners' parents only *Somewhat Like Reading*.

In addition to the overall learner reading achievement scores and parents enjoy reading, a figure is provided that indicates the percentage of learners per test language whose parents like reading for each language (see Figure 9.8).

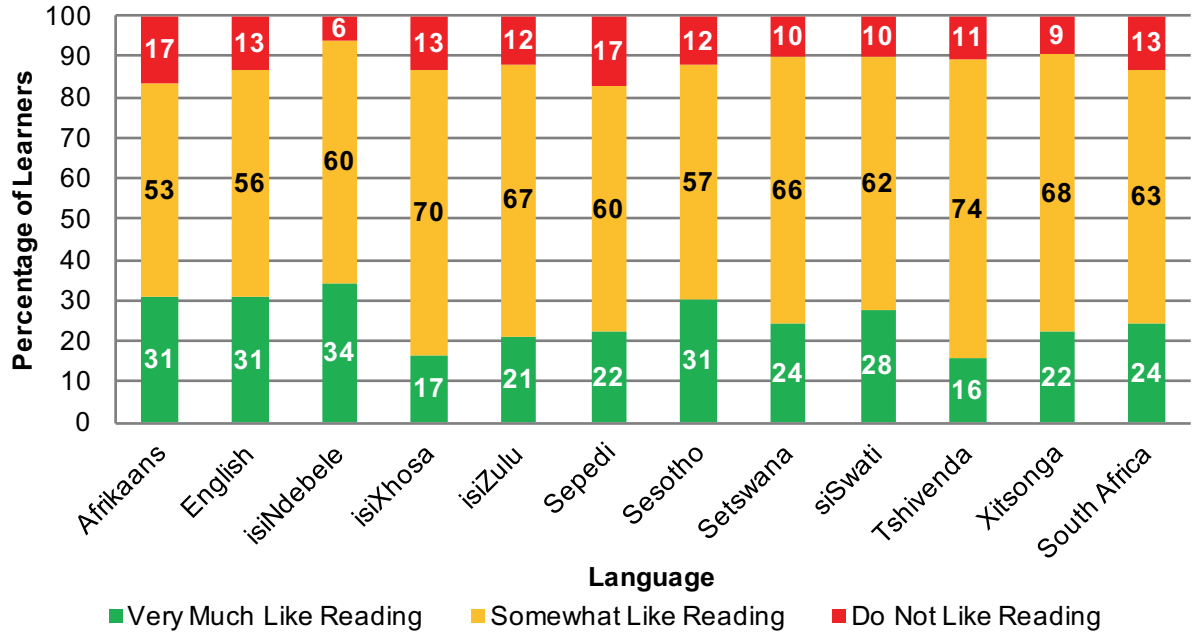


Figure 9.8: Learners' Parents who Like Reading by Test Language

Parental responses are contrary to the children's who were more positive towards reading. Only 31% of learners' parents internationally *Very Much Like Reading* and the largest group (51%) *Somewhat Like Reading*. South Africa followed the international pattern as most (63%) of the learners' parents only *Somewhat Like Reading*. Furthermore, this result varied from 53% for Afrikaans to 74% for Tshivenda. The next figure shows learner average reading literacy score when compared parental responses about like reading by language.

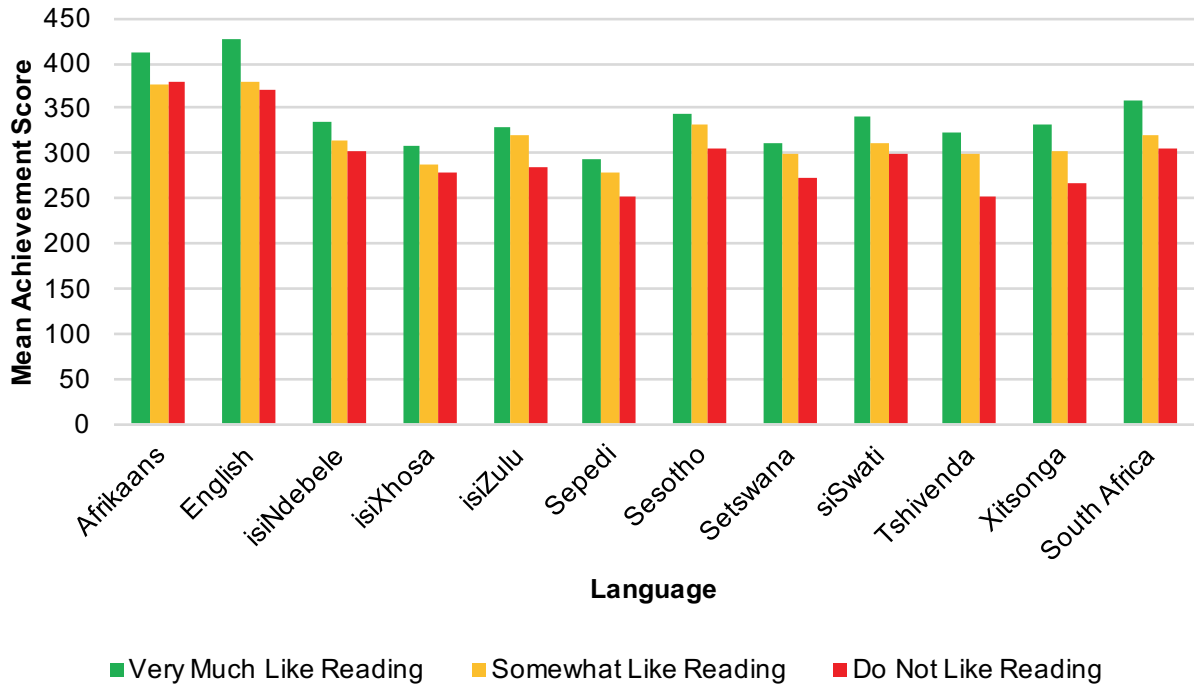


Figure 9.9: Learners' Parents who Like Reading and Learner Achievement by Test Language

In all of the languages, a positive association between parents like reading and learner achievement exists. Nationally, there was a 52-point difference in learner achievement if parents enjoyed reading compared to those who did not. The variation across languages was considerable for Tshivenda (71 points) and Xitsonga (66 points) but less pronounced for Afrikaans (32 points) and isiXhosa (28 points).

9.3.1.2 Parent-Child Conversations about Homework and School

Parents who actively engage in conversations about their homework and school with their child provide an important support. In PIRLS Literacy 2016, parents were asked about the frequency of homework that their child receives. Secondly, parents were asked to indicate whether they discussed school and homework with their child.

Table 9.1 depicts the percentage of learners regarding the frequency of their homework and their associated reading achievement scores.

Table 9.1: Learner Homework and Achievement

	% of Learners	SE of %	Mean Score	SE
My child does not have homework do	4	0.6	253	21.2
Less than once a week	8	0.6	294	10.4
1 or 2 times a week	24	1.0	313	5.3
3 or 4 times a week	26	0.8	344	6.9
Every day	38	1.6	362	7.4

Ninety-six percent of South Africa learners get homework, according to Grade 4 parents. More than one-third (38%) reported that their child does homework daily. There is a direct positive association between learners doing homework and their reading achievement scores; for instance, learners who do homework every day have an average score of 362 (SE=7.4) compared to those who do not have homework (253, SE=21.2).

The next table shows the significance per category for learner homework. For example, there is a significance difference in learner reading achievement scores between learners who have homework every day and all the remaining categories.

Table 9.2: Significance Table of Learner Homework and Achievement

	Mean Score	SE	My child does not have homework to do	Less than once a week	1 or 2 times a week	3 or 4 times a week	Every day
My child does not have homework to do	253	21.2		•	▼	▼	▼
Less than once a week	294	10.4	•		▼	▼	▼
1 or 2 times a week	313	5.3	▲	▲		▼	▼
3 or 4 times a week	344	6.9	▲	▲	▲		▼
Every day	362	7.4	▲	▲	▲	▲	

▲ Significantly higher than ▼ Significantly lower than • Not significantly different
Significance level > 0.05

Additionally, a few questions were selected from the *Parent Questionnaire* about conversations that parents have with their child about homework, these questions include:

- Ask if your child has done his/her homework
- Help your child with homework
- Review your child's homework to make sure it is correct
- Help my child practise his/her reading
- Talk to my child about what he/she is reading

Table 9.3 presents the percentage of learners whose parents indicated that these conversations about homework took place *Very Often*, *Sometimes* or *Never or Almost Never*. The table also shows learner achievement scores per category.

Table 9.3: Parents who Talk about Homework with their Child

	% of Learners	SE of %	Mean Score	SE
Very Often	86	0.9	331	5.4
Sometimes	13	0.8	319	9.1
Never or almost never	1	0.2	227	24.6

Most (86%) of the learners have conversations about homework *Very Often* with their parents. Very few (1%) of the learners *Never or Almost Never* have discussions about homework with their parents. There is a 53-point difference between learners whose parents *Very Often* engage in discussions about homework compared to those who do not.

9.3.1.3 Parental Educational Expectations for the Learners

Research has found that parental aspirations for their child can have an impact on academic achievement (see Benner & Mistry, 2007; Hong & Ho, 2005). The *Parent Questionnaire* asked parents about the highest level of education that they expected their child to achieve. Table 9.4 shows the percentage of learners according to the educational level that parents expected their child to reach.

Table 9.4: Parental Educational Expectations and Learner Achievement

	% of Learners	SE of %	Mean Score	SE
Finish Grade 9/Standard 7	4	0.3	283	10.9
Finish Grade 12/Standard 10	15	0.8	319	5.9
Finish Post-Secondary Education	10	0.6	317	7.1
Finish Technikon Diploma	9	0.6	305	8.5
Finish Bachelor's Degree	10	0.6	339	8.3
Finish Honours Degree	10	0.5	343	10.0
Finish Master's or PhD Degree	41	1.3	347	6.5

In South Africa, 15% of learners had parents who expect their child to complete *Grade 12*, while the largest group of learners (41%) were expected by their parents to complete a *Masters or PhD Degree*. Only 9% of learners had parents who expect them to complete a diploma.

Moreover, it appears that there is some association between parents' educational aspirations and learner achievement. Learners whose parents expected them to obtain *Master's or PhD Degrees* (347 points) achieved higher scores than learners of parents aspiring to the lowest level of education (283 points), *Grade 9*. There does not seem to be a significant difference in learner achievement if parents' aspirations were for their child to complete tertiary qualification levels.

Figure 9.10 presents the parents' educational expectations and learner achievement per educations level for each test language. Although there was a wider variation across languages, there seems to be a common pattern among parental responses.

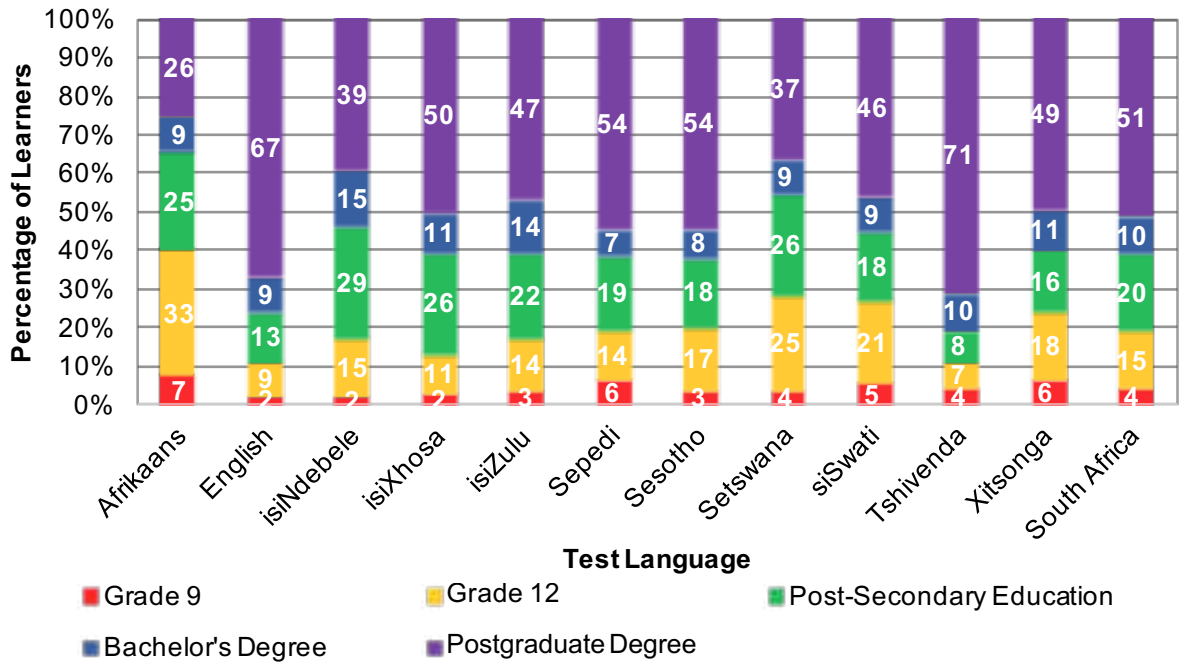


Figure 9.10: Parental Educational Expectations by Language

In 10 out of 11 languages parental aspirations were highest for a *Postgraduate Degree*. Only parents of children tested in Afrikaans largely aspired for their child to complete *Grade 12*. Whilst most (61%) of Tshivenda learners were expected by their parents to obtain a *Postgraduate Degree* only 20% of Afrikaans parents expect their child to complete a *Postgraduate Degree*.

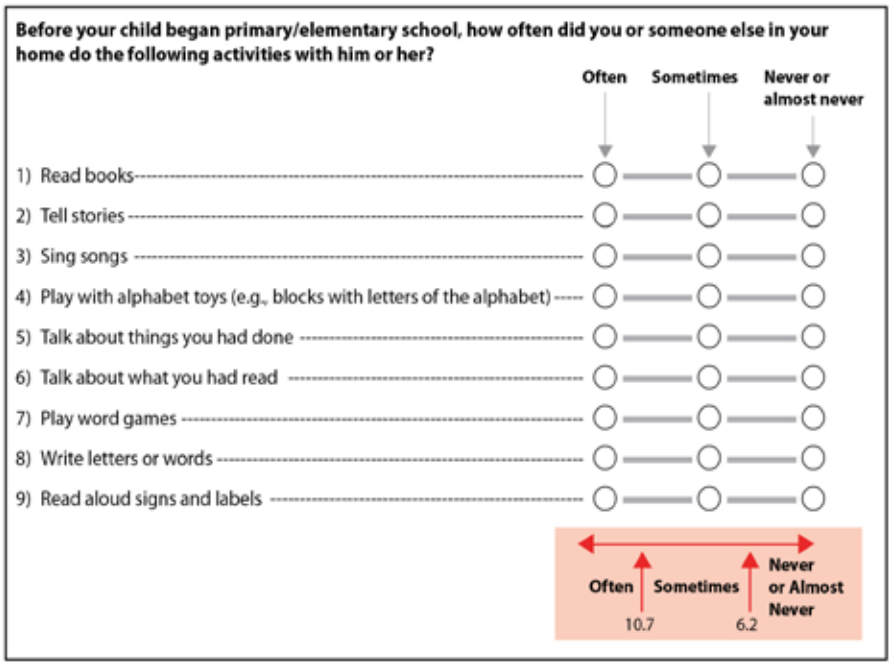
There was not a clear association between parental aspirations and achievement within each language group. Very rarely did the highest achieving group coincide with the largest parental aspirations. In four languages, the highest achievement was associated with parental selection of *Grade 12.* Only in Sesotho and Setswana did the aspiration for the child to do a *Master's or PhD Degree* coincide with the highest performance in those languages.

9.3.2 Early Literacy Experiences in the Home

The *Parent Questionnaire* asked parents to report on the early literacy experiences within the home (9.3.2.1), how well their child managed literacy tasks (9.3.2.2) and finally, whether they attended preschool (9.3.2.3).

9.3.2.1 Early Literacy Activities before Beginning Primary School

Early literacy activities are quintessential to a child's development. When parents engage in early literacy activities with their child, it has a "positive effect on the child's reading achievement" (Combrinck, van Staden & Roux, 2014, p.8). An Early Literacy Activity (ELA) scale was created to summarise parental responses to nine questions about the different types of early literacy activities in which parents participated with their children before they started primary school. The *Parent Questionnaire* asked parents to indicate how often they participated in early literacy activities with their child. The ELA scale comprises three categories, namely *Often, Sometimes* and *Never or Almost Never*. The information box below shows the cut-off points for the scale's categories.



Information Box 4: Early Literacy Activities Scale

Figure 9.11 shows the percentage of learners in each category of the ELA scale and learner average achievement in each category.

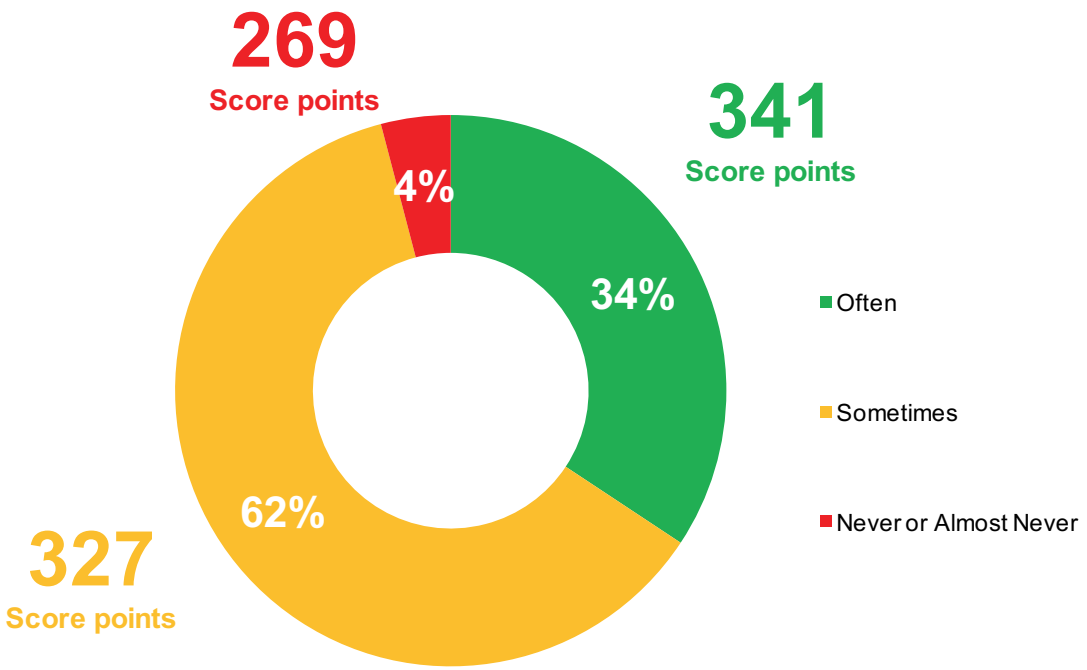


Figure 9.11: Early Literacy Activities and Learner Reading Achievement

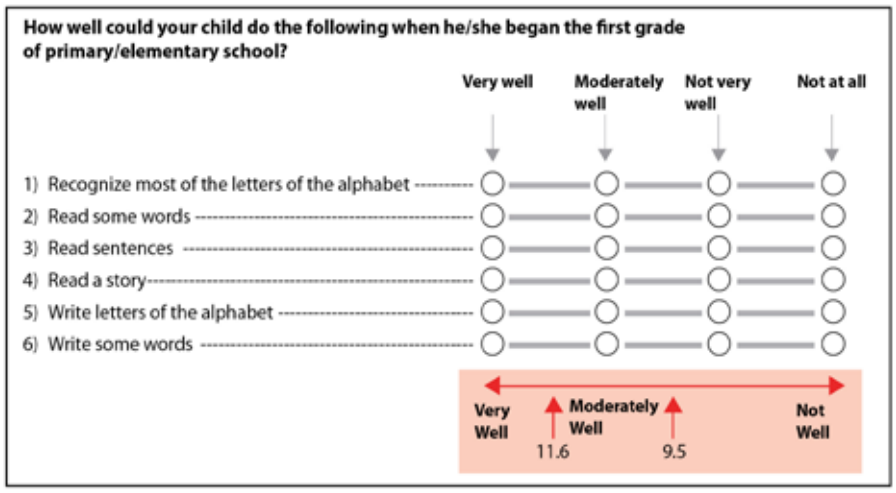
Internationally, 39% of learners' parents often engaged them in early literacy activities; these learners also achieved higher reading scores (529, SE=0.5). Very few (3%) of learners had parents who *Never or Almost Never* engaged them in these activities.

In South Africa, the majority (62%) of learners sometimes did the early literacy activities with their parents. Similar to the international findings, only 4% of learners had parents who never or almost never engaged them in those kinds of activities.

Internationally and nationally, learners achieved higher scores where parents reported their children could do these activities very well. Whilst internationally this difference was 110 points, nationally it was 72 points, indicating the importance of school readiness for later achievement at Grade 4. It appears that when learners, whose parents often engaged them in early literacy activities, achieved significantly higher scores (341, SE=7.8) compared to learners whose parents *Never or Almost Never* (269, SE=13.0) did so.

9.3.2.2 Early Literacy Tasks when Beginning School

An Early Literacy Task (ELT) scale was created to report parental responses to questions about the type of literacy tasks their children could do and how well when they first started school. This scale showed (according to the parents) which tasks the learners could perform such as read some words or read sentences before they went to school and how well. The ELT scale categories included *Very Well*, *Moderately Well* and *Not Well*. Information about the scale is presented in the following information box.



Information Box 5: Early Literacy Task Scale

Figure 9.12 shows the percentage of learners in each category of the ELT scale together with learner average reading achievement for each category.

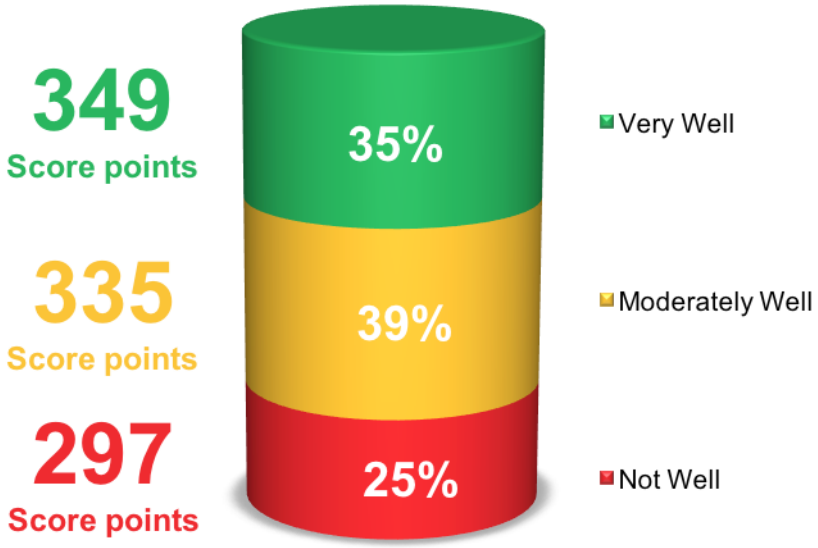


Figure 9.12: Grade 4 Learners' Early Literacy Skills and Learner Achievement

Internationally, almost one-third (29%) of learners entered school with the ability to perform the early literacy activities *Very Well*. A total of 35% of South African learners' parents reported that their child could perform early literacy activities *Very Well*. Learners achieved higher average achievement (349, SE=6.5) if they were able to do early literacy activities very well compared to *Not Well* (297, SE=7.0). It is noteworthy that more South African (35%) parents reported that their child entered primary school well prepared, in comparison to more than half of the other countries in the study. A significantly higher percentage of South Africa parents reported their child doing these activities *Very Well* compared to reports in PIRLS 2011 (see Howie et al., 2012). These learners (349, SE=6.5) also outperformed their peers who were able to do these activities *Moderately Well* (335, SE=6.1).

9.3.2.3 Learner Preschool Attendance

The early years of the child (ages 0-8) are very important to lay the foundation for lifelong learning. Many educational researchers and practitioners agree that when children attend Early Childhood Development (ECD) or preschool[36], it assists in preparing them for primary school (Anderson, Shinn, Fullilove, Scrimshaw, Fielding, Normand & Carande-Kulis, 2003). White Paper 5 set the goal for full coverage of Grade R by 2010 (DBE, 2014) as part of UNESCO's Education for All initiative. The National Development Plan (NDP) 2030 recognised that ECD is vital for later success and stipulated that there should be universal access to ECD for all children (SA Government, 2012).

[36] Preschool is an umbrella term used for any formal schooling in South African before starting Grade 1. It includes Grade R.

Figure 9.13 presents the percentage and achievement scores of learners, who according to their parents, attended preschool.

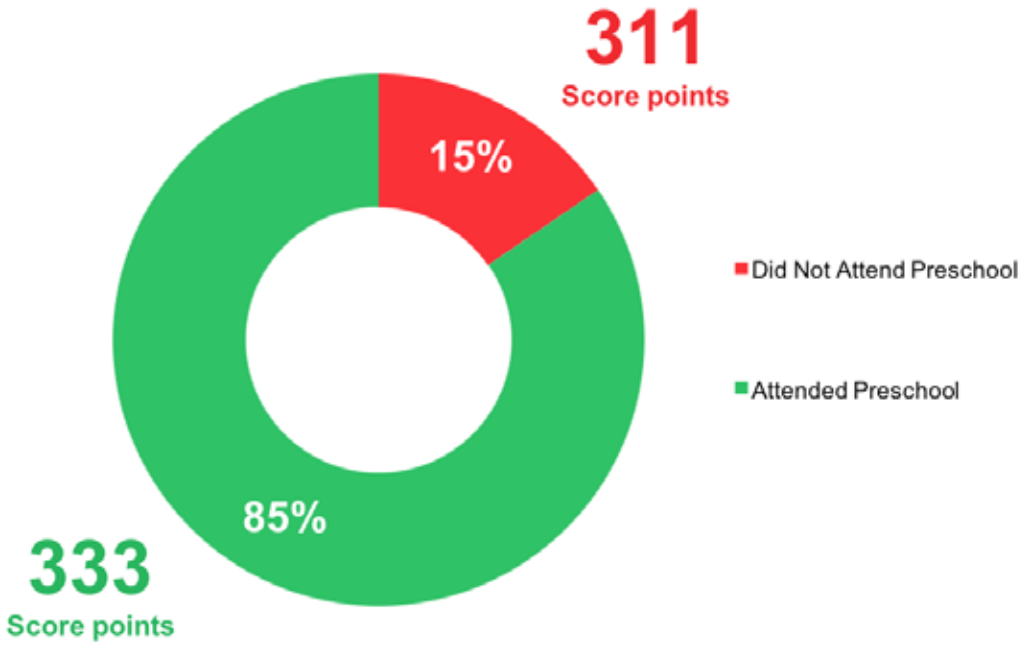


Figure 9.13: Grade 4 Learners who attended Preschool and Learner Achievement

Nationally, just over three-quarters (85%) of learners *Attended Preschool* compared to 89% internationally and these learners achieved higher mean scores (333, SE=5.9) compared to learners who *Did Not Attend Any Preschool* (311, SE=4.8).

Table 9.5 depicts the number of years learners attended preschool as reported by the parents.

Table 9.5: Number of Years at Preschool and Learner Achievement

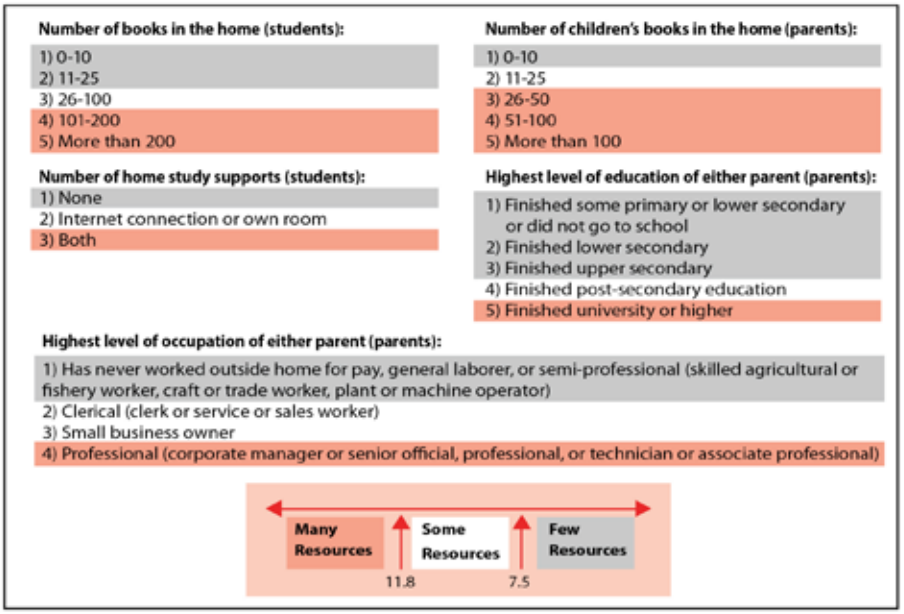
	% of Learners	% of Learners SE	Mean Score	SE
Did Not Attend	15	0.9	311	4.8
1 Year or Less	22	0.8	319	5.5
2 Years	16	0.9	337	8.2
3 Years or More	47	1.4	337	6.8

Internationally, more than half of learners (59%) had parents who reported that their child had attended *Three Years or More* of preschool. Nationally, 47% of learners attended preschool for *Three Years or More* and almost one-quarter (22%) attended preschool for *One Year or Less*.

Internationally, there is a positive relationship between the number of years learners attended pre-primary and reading achievement, as learners, who had attended *Three Years or More*, achieved 48 points more than those who *Did Not Attend*. In South Africa, there also appears to be a positive association for learners between the total number of years they attend preschool and their reading literacy achievement. For example, South African learners who attended *Three Years or More* of preschool obtained higher achievement scores (337 points) compared to those learners who *Did Not Attend* (311 points) preschool or who only attended preschool for a *One Year or Less* (319 points).

9.3.3 Educational Resources in the Home

The *Parent Questionnaire* asked parents about the various types of resources available in the home. The Home Resources for Learning scale combines data from both the learners and their parents and the scale range, *Few, Some* and *Many Resources*, was created to report on the resources available at home. The level of educational resources in the home was gauged by five questions on resources, books in the home (including children's books specifically), highest level of education and occupation of the parents. The information box below shows which items the Home Resources for Learning (HRL) scale included as well as how each was grouped according to the scale's three categories.



Information Box 6: Educational Resources in the Home Scale

Over the years, research has shown that there is a strong relationship between learner achievement and socio-economic status (SES) (Chakraborty & Harper, 2017; Howie et al., 2012; McLeod Palane, *in press*; Roux, 2014; Spencer, Clegg, Stackhouse & Rush, 2017). Previous cycles of PIRLS have found that there is a positive relationship between parental education and occupation and learner achievement (Howie et al., 2009; Mullis et al., 2012; Mullis, Martin, Kennedy & Foy, 2007).

[37] For South Africa, the data are available for less than 50% of the learners.

Figure 9.14 shows the percentage of learners at each category of the PIRLS Literacy 2016 Home Resources for Learning scale[37]. Note that the scale was created on the resources described in Information Box 6.

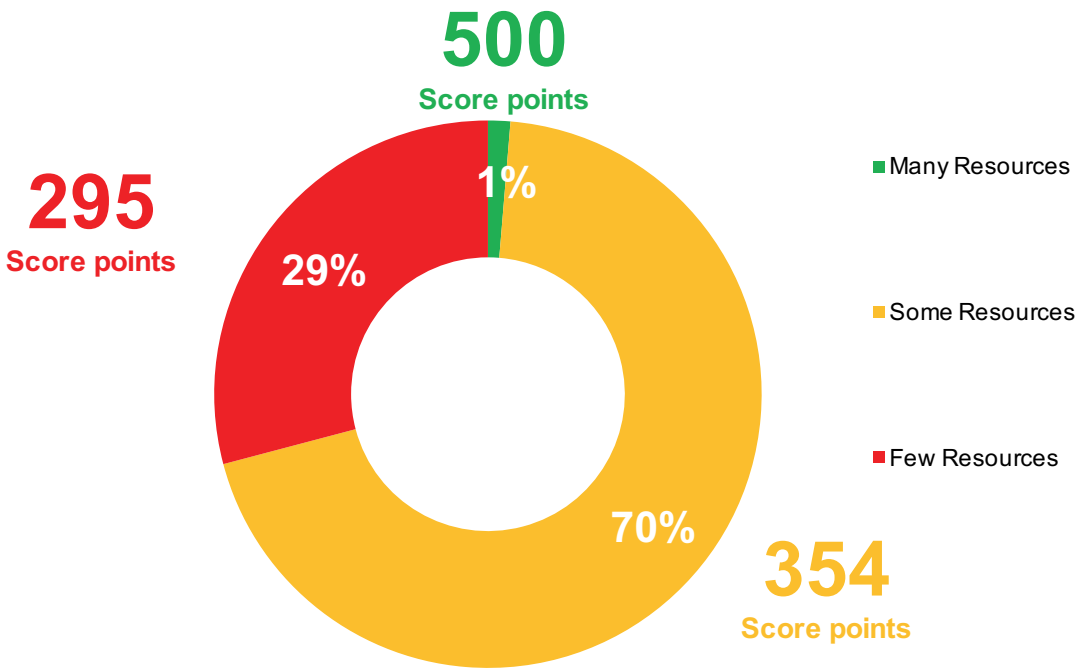


Figure 9.14: Home Resources for Learning and Learner Achievement

Internationally out of all the countries, South Africa's level of resources was similar to the other African countries in the study, which were amongst the lowest. Only 1% of South African learners come from homes with *Many Resources* compared to 20% internationally. Norway, Sweden and Denmark had 40% of learners or more in homes with *Many Resources*.

The majority (70%) of South African Grade 4 learner homes could be described as having *Some Resources*. A positive association between home resources and learner achievement was observed. In South Africa, learners who have *Many Resources* obtained the highest mean score of 500 (SE=16.2) (same as the international average for achievement) compared to learners who are in homes with *Some Resources* (354, SE=6.4) and *Few Resources* (295, SE=5.6) more than 200 points difference and five years in education terms. It appears that having books in the home, child's own room, Internet access, better-educated parents and higher level occupation contributed substantially to learner reading literacy achievement.

[37] For South Africa, the data are available for less than 50% of the learners.

9.4 Conclusion

This chapter summarised the findings related to the home environment. The South African learners were older, had less access to resources at home than their peers internationally, but similar proportions of learners spoke the test language at home.

Whilst most Grade 4 learners were positive about reading, most of their parents were less positive. Learners of parents, who were less positive, achieved much lower scores than learners whose parents liked reading. Almost all learners have homework on a weekly basis with only a very few parents indicating that their children do not get homework. About four out of ten learners receive homework every day.

Nationally, 85% of learners attended preschool compared to 89% internationally and these learners achieved higher mean scores compared to learners who did not attend preschool. However, only 68% parents of learners responded to this question. It is worth noting that in 2006, 87% of learners attended some form of preschool education whilst in 2011, 82% of learners attended preschool. In both previous cycles of PIRLS, the majority (more than 80%) of parents responded to the question about their child attending preschool.

A large proportion of South African parents have exceptionally high educational expectations for their children as 41% of the parents would like their child to finish a Master's or PhD Degree, followed by completing a Bachelor's or Honour's Degree. There appeared to be little interest in the Post-Secondary Education option.

A large percentage of households have, on average, some resources at home. Very few learners come from homes that are well resourced - books at home, study supports such as Internet access and tertiary parental education and higher occupation levels. These learners achieved at the international average score (500, SE=16.2) and higher than their peers.

In conclusion, the home environment appears to be an important factor in learner reading literacy achievement. Learners without resources and active parental involvement tend to perform lower than their peers.

CHAPTER 10: CONCLUSIONS AND REFLECTIONS

Sarah Howie

In this chapter, an overview of the PIRLS 2016 is given, followed by the key findings for the Grade 4 learners in PIRLS Literacy and the conclusions and implications arising from the findings.

10.1 Overview of PIRLS 2016

Progress in International Reading Literacy Study (PIRLS) 2016 is an international comparative evaluation of reading literacy of Grade 4 (9 year-old) learners. PIRLS is a trend study and therefore, the design and methods applied have been carefully developed and utilised to permit the measurement of changes over time. South Africa has participated in three rounds, namely 2006, 2011 and 2016.

PIRLS 2016, PIRLS 2011 and PIRLS 2006 were all undertaken by the Centre for Evaluation and Assessment (CEA) at the University of Pretoria, which served as the National Research Centre. These studies were conducted under the auspices of the International Association for the Evaluation of Educational Achievement (IEA) responsible for the overall research design, encompassing the reading curriculum framework and the research questions. Very specific and high standards were instituted to guide the sampling process, quality assurance of the translation phase, the contextualisation of items and the data collection phase. The data cleaning and data analysis took place within both the National Research Centre (CEA) and at the IEA's International Data Processing Centre. The outcomes of all the quality assurance processes indicate that the data and the processes involved in the conduct of the study were both valid and reliable.

PIRLS 2016 was conducted in 50 countries and with 11 benchmark participants comprising 340 000 learners from 12 000 schools in 2015/2016. It is one of the largest, most complex and influential assessments of reading literacy internationally. In South Africa, 18 092 learners from 349 schools in Grade 4 (12 810 learners) and Grade 5 (5 282 learners) participated. South Africa's participation in both PIRLS 2006 and PIRLS 2011 had revealed a very low level of achievement in reading literacy. At both Grades 4 and 5, the average performance of learners was well below the international average of 500 points at both grades in both studies.

The low achievement results in PIRLS 2006 led directly to a change in the national design for PIRLS 2011, which also impacted on the design for 2016. For PIRLS 2016 at the Grade 4 level, a decision was made to assess the learners with a less difficult assessment, called PIRLS Literacy, designed by the international study centre with the assistance of the national

centres. Processes similar to those of PIRLS were followed in the design and development of PIRLS Literacy, but designed as a shorter, easier test and at a lower cognitive level than that of PIRLS 2016. prePIRLS 2011 with similar characteristics to PIRLS Literacy represented a new baseline measure for South Africa for Grade 4, and in both years, were tested in all 11 languages. The African language groups had been not assessed at Grade 5 level in 2011 due to the very low levels of performance in PIRLS 2006 and the difficulty found in accurately measuring trends in those nine languages. However, in PIRLS 2016, it was decided to include the largest language group isiZulu to ascertain whether there had been any developments in the African languages to inform future decisions regarding the design. Ten-year trend data was therefore possible for learners tested in Afrikaans and English for Grade 4 and Afrikaans, English and isiZulu at the Grade 5 level in PIRLS 2011.

This report focuses primarily on significant factors linked internationally to the achievement of South African Grades 4 learners. This report presents the first descriptive analysis of the PIRLS 2016 data, whilst the Grade 5 Benchmark participants will be reported separately as will the ePIRLS study in other reports. In this chapter, the key findings are summarised, followed by some initial reflections and implications.

10.2 Key Findings for PIRLS 2016

Firstly, the key findings are presented for international and national achievement and thereafter, some of the key findings from the contextual data collected from learners, parents, teachers and principals are given.

How did South Africa perform in PIRLS 2016 and how does this compare internationally and with previous studies?

Internationally, out of 50 countries assessing Grade 4 learners, the top performing countries were the Russian Federation, Singapore, Hong Kong SAR, Finland and Ireland with four out of the five the same as PIRLS 2011. The Russian Federation learners achieved significantly higher scores than all others in the study. Hong Kong SAR and Singapore had used earlier results of PIRLS 2001 and PIRLS 2006 to implement systemic reforms in the reading curriculum, instructional materials and teacher education, as had the Russian Federation (the top performing country for PIRLS 2006 and 2011) following structural changes. Furthermore, three countries (including the Russian Federation) had raised their levels of reading achievement consistently between 2001 and 2016. Girls continued to outperform boys internationally, as they had in 2006 and 2011.

Ninety-six percent of learners internationally have been educated to reach a basic level of reading (called the Low International Benchmark). Some countries succeeded in reaching this benchmark almost universally, with 99% of learners from the Russian Federation, Hong Kong SAR, Norway (Grade 5), Latvia, Netherlands and Croatia doing so. Impressively, almost one-third (up from one-fifth in 2011) of learners from Singapore reached the highest level of achievement, the Advanced International Benchmark. This contrasts with the African countries

where less than 40% achieved the Low International Benchmark and almost none achieved the Advanced International Benchmark.

For South Africa, the following conclusions were drawn:

For South Africa overall, the results were very low (320 points) compared to the international average (500 points), with South Africa achieving the lowest results of the 50 participating countries and significantly below all other participating countries, except for Egypt. South Africa's performance in the PIRLS Literacy was below the other four participating countries and was more comparable with other African countries such as Egypt and Morocco. No significant difference in achievement for South African learners was noted between 2011 and 2016 despite the lower score in 2016.

There is a significant *gender* gap in achievement, with South African Grade 4 girls outperforming boys overall, and whose achievement had improved since 2011. This was not the case for boys, whose scores had declined. South Africa had the second largest gender gap internationally.

Across the 11 *languages*, learners attained more than 100 points below the international average with the highest score achieved by those writing in English (372 points). Learners tested in African languages, achieved well below the international average (500) despite writing an easier assessment and a higher proportion writing in their home language than previously. These learners were still performing at a low level overall on an easier assessment than were their counterparts internationally. However, in five languages, there were significant increases in achievement since 2011 (isiNdebele, Sepedi, Sesotho, Tshivenda, Xitsonga); however, Sepedi, the lowest group, was 224 points below the international average. Despite a decline in achievement by around 30 points, there was no significant decrease for Afrikaans (-28 points) and English (-31 points).

There was great variation in the *provincial* level achievement scores from Western Cape (377 points) to Limpopo (285 points), the latter 215 points below the international average. Both the Western Cape and Gauteng revealed individual achievements above 500 points at the 95th percentile, whilst the Eastern Cape exhibited very low achievements at the 5th percentile stretching to almost 100 points. Only the Western Cape learner achievement is significantly higher in achievement than any other province, with the exception of Gauteng.

Fewer learners were able to reach a rudimentary level of reading and attain the Lowest International *Benchmark* in 2016 (22%) than in 2011 (24%) with almost eight out of 10 learners not reaching the Low International Benchmark. Of concern is the drop at the top of the achievement distribution with fewer learners reaching the highest international benchmark, Advanced (0.2%) and High (1.7%), meaning very few were able to read at a more advanced level. In the African languages, 80% of learners were unable to reach the international benchmarks and nine out of 10 children, writing in Sepedi (93%), did not attain this level. This failure points to an inability to locate and retrieve explicitly stated detail when reading literary texts. When reading informational texts, not reaching the Low International Benchmark also

implies an inability to locate and reproduce two or three pieces of information from within the text, and to use subheadings, text boxes and illustrations to locate parts of the text when reading informational texts (see Chapter 2). However, from a very low base in 2011, larger percentages of learners in seven languages (isiNdebele, Sepedi, Sesotho, Setswana, siSwati, Tshivenda and Xitsonga) achieved the Low International Benchmark. In contrast, smaller percentages of learners writing in Afrikaans, English and isiXhosa reached the international benchmarks. In every province, more than half of the learners did not reach the international benchmarks ranging from 55% in the Western Cape to 91% in Limpopo, meaning that effectively, about nine out of 10 children in Limpopo cannot read at the rudimentary level. There is no trend data available for the Grade 4 African languages.

Who are the learners in PIRLS 2016 and what type of environment do they have at home?

The South African learners were older, but similar proportions of learners spoke the test *language at home* to their peers and larger proportions of learners spoke the test language at home compared to some high achieving countries. However, they had significantly less access to *resources at home* than their peers internationally. Very few learners come from homes that are well resourced (books at home, study supports such as Internet access and tertiary parental education and higher occupation levels). Those that do achieve at the equivalent level of the international average score and much higher than their peers.

Grade 4 who *liked reading*, and were *confident* readers, achieved higher scores. Furthermore, children of *parents who liked reading* achieved on average higher scores than those whose parents did not. Whilst most Grade 4 learners were positive about reading, most of their parents were less positive. Learners of parents, who were less positive, achieved much lower scores than learners whose parents liked reading. Almost all learners have *homework* on a weekly basis with only a very few parents indicating that their children do not get homework. About four out of ten learners received homework every day.

Nationally, 85% of learners attended *preschool*, which was comparable to 89% internationally and these learners achieved higher mean scores compared to learners not attending preschool. An unknown factor is the effect of the low response rate for this question. It is worth noting that in 2006, 87% of learners attended some form of preschool education whilst in 2011, 82% of learners attended preschool. In both previous cycles of PIRLS, the majority (more than 80%) of parents responded to the question about their child attending preschool, which was not the case in 2016.

As in 2011, a large proportion of South African parents have exceptionally high *educational expectations* for their children as 41% of the parents would like their child to complete a Master's or PhD Degree. In general, a much higher proportion of South African parents aspire to their children undertaking postgraduate education than the international average, which is already considered high. There appeared to be little interest in the Post-Secondary Education option.

Finally, the home environment appears to be important in reading literacy achievement, and whilst this report has not exhausted exploring the data, it is clear that learners without resources and active parental involvement tend to perform lower than their peers.

What was the classroom environment of the PIRLS learners and what was the profile of the teachers who taught them language?

A complex and varied *profile* of the teachers emerged who taught the PIRLS 2016 learners. In contrast to 86% of learners internationally being taught by highly *qualified teachers* with Bachelor's or postgraduate teachers, this was seldom the case in South Africa. Less than half of the learners were taught by degreed teachers. A small but significant percentage of learners (7%) were taught by teachers whose highest qualification was not completing/ completing Grade 12. Almost half of the teachers who participated in the PIRLS Literacy study had completed a Post-Secondary Education qualification from a College of Education. Twenty percent of the Grade 4 learners were taught by teachers who had a secondary school teaching qualification. One in 10 learners was taught by teachers with the outdated Junior and Senior Primary Teachers Certificates. On average, South African teachers had taught for 15 years, a reduction in the number of years from 2011, indicating fewer more *experienced* teachers. A concern arises with the teacher's *age*, as it did in 2011, with fewer younger teachers in the profession and in some provinces, there was an absence of teachers younger than 30 years. Universally, the percentage of teachers in the 30-39 age bracket was very low. Almost half (49%) of the Grade 4 learners were taught by teachers who were aged between 40 and 49. There was no linear association of teacher's age and achievement. Most of the teachers had reported that they are very *satisfied* with their profession. The learners taught by teachers with positive dispositions towards their careers achieved higher scores than those learners who were taught by teachers less satisfied with their careers.

The average *class size* was 45, which was substantially larger than class sizes in 2011 where the average Grade 4 class size was 40. For a number of languages, the class size average exceeded 50. South Africa teachers reported the most time spent on instruction out of all 50 countries and almost double the time spent by the top performing countries in PIRLS. The difference is that the South African teachers spend about 10% of their time on reading compared to the Russian teachers spending almost three times that amount. South African teachers indicated that they spent a total of 20% of their total instruction on *language instruction* which includes reading, writing, speaking, literature and other language skills. Short stories and non-fiction subject area books were the most popular type of literary and informational text, respectively, among teachers. There was no relationship found between instructional time and achievement in reading, possibly indicating a lack of effective teaching and learning. There is considerable variation across languages in terms of time on task for language and reading.

As in 2011, the teaching of more *complex reading skills* (such as making generalisations, describing text style and structure, and determining the author's perspective) is introduced at a much later stage for South African learners than internationally. Learners exposed at an earlier grade tended to achieve higher scores in reading.

More than half of the Grade 4 learners indicated that they *like reading* and achieved higher scores than their peers. Most teachers (81%) reported that the majority of learners have, to some extent, a *lack of prerequisite knowledge* required to cope fully with the curriculum demand for Grade 4. There were very few of the Grade 4 learners who were considered not to be lacking the prerequisite knowledge and skills. In terms of learner readiness to learn, three times as many South African learners were *absent* from school on a weekly basis than their peers internationally, which was negatively associated with their achievement. Double the international average, almost two-thirds of the South African Grade 4 learners suffer from some lack of *nutrition* according to their teachers (especially in the Eastern Cape and Mpumalanga) and achieved lower scores than those who do not lack nutrition. In conjunction with the aforementioned, most of the Grade 4 learners go to school feeling somewhat tired and more especially in the dense urban areas.

How was the environment of the schools that the PIRLS Literacy learners attended and how did it relate to reading achievement?

A large percentage (39%) of Grade 4 learners came from schools in remote *rural* areas. These learners also achieved considerably lower scores than their peers in other areas. Three-quarters of schools comprised mostly learners from disadvantaged *economic backgrounds* with more affluent learners achieving more than 100 points more than learners in schools with less affluent learners. A higher proportion of parents seem satisfied with their child's school than internationally and there appears to be an association with better achievement.

Less than 10% of school principals indicated that in their schools the majority of learners entered school with *early literacy skills*. These learners achieve higher scores than those in schools where a smaller percentage of learners enter with early literacy skills.

Very few (6%) school principals reported that their schools are not affected by *resource shortages*. Almost nine out of ten (89%) school principals indicated that the inadequacy of the school resources hampered the teaching and learning process. Grade 4 learners who attended school where there are somewhat inadequate levels of school resources, achieved about 96 points lower than their peers, who attend schools with no resource shortages. The majority of Grade 4 learners (62%) attend schools with no *libraries* and achieved on average 48 points less than schools with libraries. As with the school libraries, most learners (57%) attend school with no *computers* available for instruction. About one out of ten school principals reported that they have a computer available for every one to two learners. These learners also achieved 60 points higher than their peers who do not have access to computers.

A small percentage of learners attend schools that principals report having a high *academic emphasis* and this is associated with higher achievement. Teacher reports about the academic emphasis at their school, however, does not relate to learner achievement. Less than half of the learners were in schools where principals reported they hardly have any problems with *teacher behaviour*. Absenteeism and failure to complete the curriculum was a problem in schools for 60% of the learners and almost half of the learners were in schools where teachers arrived

late for school. Learners in schools where there were serious problems with teacher behaviour achieved significantly lower scores than those who were in schools with no problems.

Almost half of the learners attend schools that are considered *safe and orderly* although only a few school principals indicated that there are hardly any problems with school discipline and safety. The situation in South Africa appeared more favourable than that in the other African countries. Grade 4 learners achieved on average 53 points higher if they attend schools with little or no problems compared to learners who attend schools with moderate to severe problems. The most problems seem to emerge in Northern Cape, followed by Mpumalanga and Eastern Cape. There were highly significant achievement differences (up to 100 points) in Gauteng, Northern Cape and Western Cape between groups of schools with fewer problems than those with many problems. In schools where *bullying* occurred about weekly, the learners achieved 50 points lower than their peers, who reported that they are almost never bullied at school. Learners were also asked to report on their sense of *belonging* at school. On average, when learners have a high sense of belonging, they score 31 points higher than those who have little sense of belonging.

A number of school-level factors relating to the school environment and climate seem to be significant in the PIRLS Literacy study and are positively associated with the Grade 4 learner reading literacy performance. Some of these also appear to be related to achievement over time (Howie et al., 2017).

10.3 Initial Reflections and Implications Arising

In this summary, a brief reflection is presented in terms of the main findings and their implications. The implications arising from this initial descriptive analysis of the PIRLS Literacy 2016 are already considerable. Further analyses no doubt will be forthcoming and in particular, the secondary analyses of contextual factors and their effect on achievement are to be encouraged. However, in the absence of an in-depth analysis, the following conclusions can already be made and a number of recommendations be proposed:

1. ***The national level of achievement of South Africa Grade 4 learners has remained disturbingly low and unchanged overall, during the past 10 years and compares very poorly internationally.***

   In the results presented in Chapters 4-6, it is evident that on a national level, there is no overall progress. The international comparisons provide an unflattering “mirror” for South African reading achievement revealing exceptionally low performance and maintaining the lowest ranking as in 2006. The caveat though is that the Grade 4 learners are now achieving at the same level as the Grade 5 learners were in 2006. Furthermore, the benchmark data implies a decrease both at the bottom as well as a drop at the top in the learners succeeding on the international benchmarks. The further concerns are that the performance of learners writing Afrikaans and English after an initial impovement between 2016 and 2011 has slowed and is no longer stastically

higher than 2011. This appears to be due largely to the fact that there is no significant improvement for English over 10 years. Increasing percentages of learners in this group of schools do not speak English at home. However, the positive element of the results is the significant improvement in five African languages from a very low base in 2011, and this is mirrored in their performance in the international benchmarks where larger percentages of learners are reaching at least the lowest international benchmark.

Based upon these concerning findings overall, the following recommendations are:

a. Implement a national campaign for reading which emphasises the shared responsibility of government, schools, teachers, parents, learners and the broader community and which promotes the importance of reading for success in life generally and academically in particular. Campaign for greater parental involvement in school and learner activities in general.
b. Strengthen the quality of teaching reading literacy and training of pedagogical content knowledge of teachers across all languages in the Foundation Phase and especially African languages. Emphasise the importance of higher level order reading comprehension skills and train teachers to implement these effectively. Furthermore, emphasise the importance of informational texts in addition to literary texts.
c. Review and increase the effectiveness of the implemented language curriculum. Increase the proportion of time spent on reading in Foundation and Intermediate Phases in the curriculum as well as encourage extra-mural reading and positive reading habits.
d. Initiate a pre-primary campaign for parents and teachers and emphasise the importance of Early Literacy activities at home and concentrate on the quality of training of teacher at the pre-primary level. Escalate the provision of pre-primary resources for all children.
e. Target interventions for reading literacy for high-risk populations including boys, learners living in remote rural areas, townships. Specific interventions should be focused in Limpopo, the Eastern Cape and Northern Cape provinces.
f. Urgently reduce class sizes and aim to reduce from 45 to at least policy stipulations of 40 per class with next three years and stop the “creep” that has occurred across all schools and provinces over past 10 years.
g. Provide and increase school resources such as school libraries and classroom libraries, especially in areas and communities where the performance is poor.
h. Investigate the reasons for the drop at the top and provide additional support for schools that are struggling to maintain the high standards previously met.
i. Put in place interventions that reduce the high levels of learner and teacher absenteeism from schools.

2. ***Despite substantial improvements overall in the system over past 20 years, the majority of primary schools remain either minimally or inadequately resourced for effective schooling although teachers and parents are relatively satisfied with the schools and conditions.***

This includes the human resources that are ageing, a small percentage are not qualified, and only about a third are university trained. Principal reports suggest that the lack of physical resources is hampering schools' ability to deliver effective education. The ICT provisioning has declined and the provision of school libraries has not increased. However, the provision of classroom libraries is more evident in about half of schools. Of national concern are the high levels of frequent bullying, reported by learners, which exceed the international figures. What is interesting is the relatively modest reporting on problems related to discipline and safety which seem to suggest that conditions in schools are relatively under control and that severe problems are the exception. Emerging, however, is the phenomenon of verbal abuse of teachers previously not witnessed in earlier studies. It should be noted, however, that schools are dealing with the vast majority of their learners being economically underprivileged across all language groups and provinces. Despite the challenging conditions for many schools, it seems somewhat contradictory that most teachers are somewhat satisfied with their work conditions and that parents are mostly satisfied with their children's schools. It is not clear whether they are satisfied with whatever improvements have been made or whether after so long, the expectations about change have lowered over time.

Given the above conclusion, the following are recommended that:

a. Even greater attention is given to increasing efforts to attract younger quality candidates into teaching to address attrition and that significant investment is made into teacher education to improve the quality of candidates entering the profession.
b. All schools should be provisioned with adequate resources and that all schools should be supported to achieve the enabling conditions required for effective education. The leadership of the schools should raise the expectations of both teachers and learners in terms of their outcomes and that there should be an increased emphasis on academic success and the importance of values in education.
c. All schools should be supported in implementing anti-bullying measures within schools and zero tolerance towards abuse of teachers and learners should be implemented with strict censures in place.
d. To educate learners within a 21st century society, ICT should be implemented in and integrated into all primary schools and not left until secondary school level. The current policies and interventions on ICT provision in primary schools should be reviewed, and effective and sustainable access to ICT and utilisation thereof in education needs to be increased.

3. ***Current classroom conditions and pedagogical strategies do not appear to be effective in achieving the levels of reading literacy that South Africa requires.***

Given the above conclusion, the following are recommended:

a. Increasing the time on task for reading is needed and this should be achieved by increasing the proportion of time spent on reading specifically at Foundation and Intermediate Phases consistent with the top performing countries in PIRLS 2016. Secondly, the high levels of learner and teacher absenteeism should be reduced. Decreasing the class sizes would allow more time per learner with the teacher in the classroom.
b. Increasing access to books and reading materials in the classroom, inculcating a love for reading and making time to visit libraries and take books out for reading at home are essential ingredients in the classroom. Where no school and/or classroom libraries exist, that these facilities be prioritised for building and implementation and recognised as levers for change in education.
c. Encouraging and supporting teachers in the latter stages of the Foundation Phase and in the Intermediate phase to concentrate on higher order reading skills and to train teachers in utilising the more advanced comprehension strategies in earlier stages. More exposure of learners to non-fiction and informational-type texts is needed. Furthermore, teachers' expectations of their learners need to be increased so that the learners are developed beyond failure and mediocrity.
d. Supporting the transition of languages for the majority of learners switching from their home language in Grades 1-3 to LoLT in Afrikaans and English. More extensive remedial support is required for teachers and learners during the Grade 4 transition period. Specialist support in the teaching of a second language is needed.

4. ***Few homes are well resourced to provide early childhood opportunities and continuous academic support for reading literacy and therefore, the role of parents and their interaction with schools is critical.***

a. Parents, guardians, caregivers of learners in pre-primary and primary schools need to be made aware and supported in terms of effective strategies for preparing and assisting their children for primary school. A broader community focus on reading is needed to encourage parents to inculcate a love for reading in their children. Parents that enjoy reading model that behaviour for their children. Good reading habits start in the home and therefore community libraries provide resources and a basis for parents with few means to do this. Where libraries are available frequent use of these assists in developing good reading habits and increasing the likelihood of reading literacy. Where formal libraries do not exist consideration should be given to opening such a resource attached to other education or social facilities within the community and providing access to underprivileged communities. Reading clubs already existing should be supported and where effective expanded across communities.

b. Parental involvement in the schools and familiarity with their child's teachers are essential in monitoring children's attendance of school and participation in class. Shared responsibility for education and reading literacy by the home and school as well as the individual learner is required.
c. There are many other activities that parents can do at home; for instance, including reading stories to them and discussing the story with them, singing rhyming songs, playing games with letters and words. These can be done in the early years before children go to pre-primary and primary school. Parents can also invest in books and gather appropriate reading materials for their children to read at home.

10.4 Last Word

PIRLS 2016 did not demonstrate the progress in reading literacy performance of South African learners that one might have expected after 10 years. In order to avoid a further generation of learners leaving school either prematurely or unsuccessfully, it is essential that effective strategies, some of which are recommended in this report, be put in place urgently. The importance of shared responsibility for this priority cannot be overlooked as the neither the Government nor the schools can do this alone. Instead, communities need to come together and parents, learners, teachers and school management have to work together with the Government to create better opportunities for South African children to acquire and develop their language of learning and learn to read with comprehension, deeper meaning and enjoyment in the future.

It takes a village to raise a child

(African proverb)

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GLOSSARY

Scores used in PIRLS

The PIRLS score points are also referred to as Plausible Values (PVs), or reading literacy achievement scores. The scale is from 0 to 1000, with an international centre point of 500 and a Standard Deviation of 100. The PIRLS study made use of Item Response Theory (IRT) methods to impute the achievement scores for Grade 4 learners with complex models over the course of many PIRLS cycles. All countries are placed on one scale which offers the opportunity to compare countries; for example, South African Grade 4 learners achieved an average achievement score of 320 (SE=4.4) and Egypt achieved 330 (SE=5.6), but there was no statistically significant difference between the two countries.

International comparison statistics

Within this report, a variety of comparison statistics is used such as the PIRLS centre point, international averages as well as the international median. Below is a short description of each:

- PIRLS centre point: the mean of the scales established in the first cycle of the study (2001). The mean was calibrated to be 500 with a standard deviation of 100 score points
- International average: the mean score of all the participating countries in PIRLS or PIRLS Literacy
- International median: the midpoint of countries that are ranked by score or percentage. Half of the countries will have a score or percentage above and the other half below the median.

Statistical significance

In this report, the term ‘significant’ is used to describe the difference between two groups that meet the statistical significance requirements at the 0.05 level. At this level, the result, being a random occurrence, is less than 5%. A difference can only be described as ‘significant’ if the statistical analysis, for example independent t-test, was completed. A result is reported as significant if $p < 0.05$, and therefore the t-values are smaller than -1.96 or larger than 1.96. If the t-value is smaller than -2.58 or above 2.58, then the associated p value is < 0.01.

Effect Size

In the PIRLS study, 40 score points are seen as a year of schooling (approximately half a Standard Deviation). Generally, an effect size of 0.5 (half a Standard Deviation) is considered to be moderate in size, therefore 40-50 score points is seen as a medium effect size in this report.

Standard Deviation (SD)

The Standard Deviation is a descriptive statistic that describes the spread of the scores around the sample mean. When the aim is to describe the sample, then the SD provides useful information and should be reported. However, if the aim is to report the sample values as representing the true values of the population, then the Standard Error should be reported (as is done in PIRLS).

Standard Error (SE)

The Standard Error is an inferential statistic that estimates the accuracy with which a sample represents a population. A large SE shows that the data are widely spread (less reliable) and a small SE shows that the data are clustered closely around the mean (more reliable). In PIRLS, large SEs are greater than 10 (rule of thumb). Greater than 20 should be noted as it may indicate too much variance around the mean (as much as 40 score points on either side of the mean).

Example: The mean score for South Africa in the PIRLS Literacy Study was 320 score points with a Standard Error of 4.4. The 95th confidence interval is calculated by taking the mean and deducting two SEs and adding two SEs on either side:

Confidence Interval Range = 320 + (4.4*2) and 320 - (4.4*2)
= 329 and 311

There is **95% confidence** that the true mean score of the South African PIRLS Literacy results lies between **311 and 329** score points.

Rounding of figures

In this report, some percentages in the tables may not add exactly to the totals (adding up to 99% or 101%). This occurrence is due to the rounding of these percentages to eliminate the additional decimals. Note that the totals, percentages and averages are calculated from exact numbers and are only rounded after the calculation is completed. All Standard Errors (SE) have been rounded to one decimal place and are shown as 0.0. The average achievement scores are also based on exact numbers and have been rounded up to have zero decimal places; for example 499.95 is rounded to 500.

Language spoken at home

The South African language landscape can be seen as complex as there are 11 official languages. Grade 4 learners and their parents were both asked to indicate whether the learner spoke the Language of the Test (LoT) at home. Parents could indicate yes or no. The learners were asked how often they spoke the test language at home and whether they also speak more than one language at home. This means that the language of the test is not necessarily the home language. It also important to note that South Africa has multi-lingual homes in some

cases. Learners were tested in their Language of Learning and Teaching (LoLT) which they had from Grade 1 to 3. In the case of African language schools, they switch to English as medium of instruction and therefore the test language is not their current LoLT.

Reading the achievement graphs

A percentile graph is generally used to report test scores or results to a specific audience. These graphs allows values to split the data into equal parts ranging from 1 to 99 and is used to determine where a specific score fits in with the broader distribution. For more information on how to interpret a percentile graph, please see Chapter 4.

Total Weighted Percentage

The PIRLS samples are drawn to be representative of the population. Therefore, in the data chapters the percentage of learners is reported based on the TOTWGT (total weighted percentage). For example, if 46% of the learners were in isiZulu schools (calculated on actual learners participating), the weighted percentage would be reported as 39% because that is the portion of the population represented by the data.

List Of Acronyms And Abbreviations

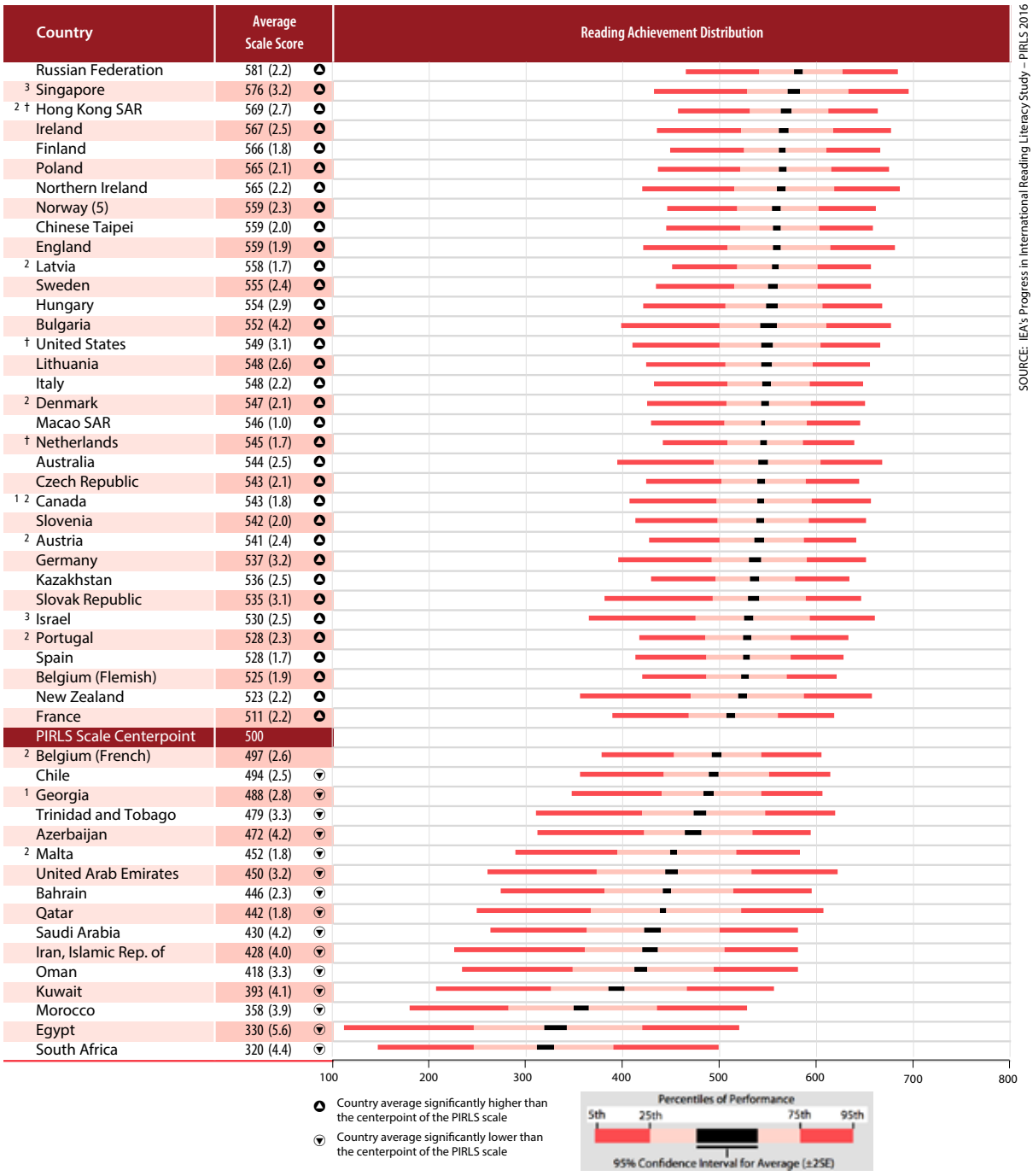
ANA	Annual National Assessments
CAPS	Curriculum Assessment Policy Standards
CEA	Centre for Evaluation and Assessment
CR	Constructed Response
DBE	Department of Basic Education
DME	Data Management Expert
DoE	Department of Education
DPC	Data Processing Centre (in Hamburg)
ECD	Early Childhood Development
EFA	Education for All
ELA	Early Literacy Activity
ELT	Early Literacy Task
FAL	First Additional Language
GDP	Gross Domestic Product
GER	Gross Enrolment Rates
HRL	Home Resources For Learning
ICT	Information Communication and Technology
IDB Analyzer	International Database Analyzer
IEA	International Association for the Evaluation of Educational Achievement
EMIS	Education Management Information System
IRT	Item Response Theory
LiEP	Language in Education Policy
LoLT	Language of Learning and Teaching (Grade 1 -3)
LoT	Language of Test (also referred to as Test Language)
MC	Multiple Choice
NCS	National Curriculum Statement
NDP	National Development Plan
NRC	National Research Co-ordinator
PIRLS	Progress in International Reading Literacy Study
PL	PIRLS Literacy
PPS	Probability Proportional-to-Size
PRL	Parents Reading Like Scale
PVs	Plausible values
QCM	Quality Control Monitors
QDG	Questionnaire Development Group
SAQA	South African Qualifications Authority
SAS	Statistical Analysis Software
SASA	South African Schools Act
SD	Standard Deviation
SDG	Sustainable Development Goals
SE	Standard Error
SES	Socio-economic Status
SPSS	Statistical Package for the Social Sciences
STAT CAN	Statistics Canada (responsible for sampling)
TIMSS	Trends in International Mathematics and Science Study
TOTWGT	Student Weight
UK	United Kingdom
UP	University of Pretoria
US	United States of America

Appendix A:
Languages per Province

Province % of Learners	Test Language	Percentage of Learners	Standard Error of Sampling
Eastern Cape 18%	Afrikaans	9,9%	3,4
	English	13,3%	2,1
	isiXhosa	74,7%	3,4
	Sesotho	2,1%	1,5
Free State 5%	Afrikaans	11,9%	7,6
	English	11,5%	3,7
	isiXhosa	1,4%	0,3
	isiZulu	2,4%	0,3
	Sesotho	72,8%	8,6
Gauteng 17%	Afrikaans	5,8%	2,9
	English	48,7%	6,3
	isiZulu	21,4%	4,4
	Sepedi	9,5%	2,2
	Sesotho	5,3%	2,9
	Setswana	3,3%	0,8
	Xitsonga	5,9%	3,2
KwaZulu Natal 21%	English	22,9%	2,8
	isiXhosa	1,9%	0,1
	isiZulu	75,2%	2,8
Limpopo 12%	English	7,0%	5,5
	isiZulu	2,2%	2,1
	Sepedi	56,5%	4,6
	Setswana	2,9%	2,9
	Tshivenda	17,7%	2,1
	Xitsonga	13,7%	2,0
Mpumalanga 8%	Afrikaans	1,2%	1,2
	English	18,3%	4,2
	isiNdebele	3,1%	0,6
	isiZulu	27,4%	5,2
	Sepedi	8,4%	7,8
	siSwati	28,7%	3,2
	Xitsonga	12,9%	4,9
North West 7%	Afrikaans	6,8%	6,5
	English	10,7%	5,7
	isiXhosa	5,4%	5,2
	Sesotho	2,3%	2,3
	Setswana	74,8%	8,4
Northern Cape 2%	Afrikaans	40,5%	6,3
	English	21,5%	7,7
	Setswana	38,0%	8,2
Western Cape 9%	Afrikaans	45,4%	4,6
	English	35,4%	4,4
	isiXhosa	19,3%	3,6

Note: Analysis of mean reading achievement scores of languages within provinces (and vice versa) is not recommended when samples are too small and SEs become too large

Appendix B:



SOURCE: IEA's Progress in International Reading Literacy Study – PIRLS 2016

Appendix C:
Reading Skills and Strategies

	Grade 1 or Earlier		Grade 2		Grade 3		Grade 4	
Reading Skills and Strategies	**Mean Score**	**SE**	**Mean Score**	**SE**	**Mean Score**	**SE**	**Mean Score**	**SE**
Knowing letters of the alphabet	319	5,4	340	23,3	284	18,2	294	16,1
Knowing letter-sound relationships	329	5,9	279	10,3	307	7,5	246	50,8
Reading words	324	6,0	298	9,4	273	12,3	299	4,9
Reading isolated sentences	338	7,0	296	6,5	280	13,2	278	12,3
Reading connected text	354	10,4	309	5,9	288	9,4	277	9,1
Locating information within the text	359	15,0	318	7,5	309	6,5	283	16,0
Identifying the main idea of a text	368	17,7	319	9,6	318	6,2	304	8,3
Explaining or supporting understanding of a text	349	16,8	334	15,5	325	5,5	303	6,8
Comparing a text with personal experience	374	18,7	336	17,0	318	7,6	304	7,0
Comparing different texts	373	22,9	340	24,4	336	7,7	301	6,5
Making predictions about what will happen next in a text	347	12,5	319	16,7	333	10,6	301	8,0
Making generalisations and drawing inferences based on a text	346	18,5	342	19,6	325	8,0	307	8,9
Describing the style or structure of a text	362	45,0	344	20,2	337	14,1	310	6,3
Determining the author's perspective or intention	366	33,2	342	22,1	333	17,7	312	8,6

Appendix D:
National Steering Committee PIRLS 2016

Carole Bloch	PRAESA
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Celeste Combrinck	University of Pretoria
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THE AUTHORS

Sarah Howie

Professor Sarah Howie was the National Research Co-ordinator (NRC) of PIRLS in South Africa for three rounds: 2006, 2011 and 2016. She is a well-known leader in the field of large-scale assessment and was previously NRC for TIMSS 1995 (pop3), 1999, SITES M1 and 2006, and contributed internationally to PISA 2015, 2018, TALIS 2018. She was a member of the IEA's International Questionnaire Development Group for PIRLS 2011 and 2016. In addition to writing, she was also the editor of this report. She led the PIRLS team during the entire process of design, implementing and disseminating the study.

Celeste Combrinck

Celeste Combrinck was responsible for co-ordinating the PIRLS 2016 field trial, the data collection of the main study as well managing the dissemination for PIRLS 2016. Celeste's main interests are instrument design and refinement in the social sciences, as well as analysis, article and report writing combined with dissemination of findings.

Karen Roux

Karen Roux was involved in the PIRLS 2011 and PIRLS 2016 South African cycles. In the latest round of PIRLS, she was directly responsible for the preparation of the instruments, which includes the translation and verification of the questionnaires. Karen was also involved in the scoring processes, monitoring, data analysis and report writing. Her areas of expertise include home and classroom factors associated with reading literacy as well as instrument design and development.

Mishack Tshele

Mishack Tshele was involved in PIRLS 2011 and PIRLS 2016 as the data manager for both studies. He was responsible for the sampling frame and sample, preparation of the databases, instrument collation and organisation, training data capturers, data cleaning and management and was mainly responsible for the analysis for this report. He is a specialist in using Rasch models and managing large-scale data and conducting analysis with large-scale educational data.

Gabriel Mokoena

Gabriel Mokoena was involved in PIRLS 2011 and 2016. He was responsible for several phases of the PIRLS 2016 project, including the co-ordination of the contacting of schools, fieldwork and monitoring, training of fieldworkers, as well as being a scoring manager. Gabriel Mokoena created most of the graphics in this report and his speciality lies in corporate and institutional communication and information dissemination.

Nelladee McLeod Palane

Nelladee McLeod Palane was the Language Specialist and Scoring Supervisor for South Africa's implementation of PIRLS 2016. She participated in the international process of item development and managed the national process of translation and translation verification of the reading achievement instruments and quality assurance thereof. Nelladee is a language specialist and her expertise lies in teaching, learning and research of reading literacy and language in South Africa.

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