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Navigating the complexities: South Africa's journey in collecting data for international reading literacy assessments

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Data collection for international large-scale assessments, such as the Progress in International Reading Literacy Study (PIRLS), is a multifaceted process that demands meticulous planning, coordination, and execution to ensure accuracy and comparability across participating countries. This paper explores South Africa's endeavours in collecting PIRLS data over the last two cycles (2016 and 2021). South Africa has faced unique challenges and opportunities in its quest to provide reliable data on reading literacy among primary school students. The data collection involves a collaborative effort between national education departments, schools, and international coordinating bodies. Key steps include sampling, instrument translation and adaptation, field staff training, data collection, and quality assurance measures. Investigating South Africa's PIRLS data collection efforts highlights significant advancements in administrative capacity, stakeholder engagement, and methodological rigour. However, it also reveals persistent issues such as resource constraints, infrastructural disparities, and the need for continuous professional development. This paper underscores the importance of sustained investment in educational research infrastructure and international collaboration to enhance the quality of data collection processes. Ultimately, South Africa's experiences offer valuable insights for other nations striving to improve their participation in international assessments, contributing to a more comprehensive understanding of global educational outcomes and driving evidence-based policy decisions.

KEYWORDS

PIRLS, PIRLS literacy, data collection, test administration, translation, South Africa

1 Introduction

International large-scale assessments (ILSA) have become key instruments for benchmarking educational performance on a global scale. Large-scale reading assessments, such as the Progress in International Reading Literacy Study (PIRLS), provide useful information to stakeholders regarding reading performance across specific benchmarks and at a specific age and grade level. PIRLS, coordinated by the International Association for the Evaluation of Educational Achievement (IEA), assesses reading comprehension of Grade 4 students in five-year cycles (Mullis et al., 2023). The ILSA is designed to provide comparable data across the different participating countries. For developing countries such as South Africa, the PIRLS data gives insight into not only student reading performance, but also the robustness of the national educational system. During the last cycle of PIRLS (2021), South African Grade 4 students obtained an average score of 288 (SE = 4.4), far below the international mean, set at 500. This result is unsurprising as South Africa has consistently obtained low reading outcomes since its initial participation in 2006 (see [Department of Basic Education \[DBE\]](#),

2023; Howie et al., 2009; Howie et al., 2012; Howie et al., 2017). Other than the performance data, the contextual information collected from the students, parents, teachers and school principals through questionnaires provides insights into home and school factors that could illuminate the findings on the performance data.

Before results can be shared with the various stakeholders, the PIRLS assessment should be meticulously planned and executed to ensure accuracy and comparability across different participating countries. For South Africa, participation in PIRLS provides a unique opportunity to assess reading literacy of Grade 4 students within a socio-economically diverse, multicultural and multilingual context. The complex interplay of diversity, educational inequality, and logistical constraints makes the South African context especially instructive for educational research. This paper aims to provide valuable insights and lessons from South Africa's participation in the data collection processes from the PIRLS 2016 and 2021 cycles, highlighting contextual challenges, implications and reflections in providing reliable data on student reading literacy in the primary years.

2 Methodology of PIRLS data collection in South Africa

This paper focuses on the two most recent PIRLS cycles in South Africa: PIRLS Literacy 2016 and PIRLS 2021.

2.1 Sampling design

In both PIRLS Literacy 2016 and PIRLS 2021, South Africa employed the IEA's two-stage stratified cluster sampling design to yield nationally representative estimates of Grade 4 students' reading literacy scores (LaRoche et al., 2017; Almaskut et al., 2023). Regarding the sampling design, schools were first selected with probability proportional to size, stratified by language and province. In the second stage, intact Grade 4 classes were selected via the WinW3S sampling software (Department of Basic Education [DBE], 2023; Almaskut et al., 2023). Using this design ensures that students who have 4 years of formal education drive comparability across languages and provinces.

In 2016, the target population was all Grade 4 students; the sampling frame was stratified by the language of instruction (LoLT) and province so that the sample would represent both language groups and provinces (Howie et al., 2017). The language of the test was selected based on the LoLT used in Grades 1 to 3. In 2021, the study followed a similar approach to 2016 based on the IEA guidelines. In both cycles, the final data were weighted to the national Grade 4 population (LaRoche et al., 2017; von Davier et al., 2023). A total of 12,810 and 12,426 students participated in 2016 and 2021, respectively.

2.2 PIRLS instruments

Both cycles in South Africa included two sets of instruments, that is, the reading achievement booklets and the contextual questionnaires. The PIRLS achievement booklets assess Grade 4 students' reading comprehension with two purposes of reading: (a) reading for literary

experience, and (b) reading to acquire and use information (Mullis and Martin, 2019). Each passage was accompanied by a set of multiple-choice and extended response questions. Each question is linked to one of the four processes of comprehension that measure students' reading levels from emergent to advanced:

- Focus on and retrieve explicitly stated information;
- Make straightforward inferences;
- Interpret and integrate ideas and information; and
- Evaluate and critique content and textual elements (Mullis and Martin, 2019, p. 8).

The two cycles slightly differ in terms of the organisation of instruments. PIRLS Literacy 2016 was developed based on the need for an easier PIRLS assessment (Mullis and Prendergast, 2017), where less difficult passages were selected for testing. In terms of PIRLS 2021, group adaptive design was selected, where the passages and their accompanying items were divided into three groups: easy, medium and difficult. Countries with mean achievement scores of less than 450 score points were grouped into the 'easy' category, where 70% of the passages were considered easy and 30% of the passages were considered difficult (Wry and Mullis, 2023). South Africa was grouped into the 'easy' category (Department of Basic Education [DBE], 2023).

2.3 Instrument translation and adaptation

The translation of the PIRLS instruments into the 10 other official South African languages proved a challenging task. During PIRLS Literacy 2016, the materials were first adapted from US-English to UK-English and adjusted for local contexts, then translated into the 10 other official languages. This translation process was completed within 6 weeks as the international instruments arrived late (Howie et al., 2017). As part of the IEA standards, an independent verification also took place by a second certified company. To ensure that the translations were appropriate in terms of language used and concepts defined at the Grade 4 level, a panel of Grade 4 language teachers reviewed each version of the test booklets (Howie et al., 2017). The final sets of achievement booklets were sent to the IEA for translation verification, where any inconsistencies were directed back to the National Research Coordinator (NRC) for clarification and correction.

For PIRLS 2021, the translation procedures occurred during the COVID-19 pandemic and its accompanying restrictions (Mullis et al., 2023). The translation procedures evolved from the previous cycle to a five-step procedure where forward and back translation occurred, draft versions were revised by language specialists, DBE consultation and reconciliation against the source language, English, to resolve any discrepancies (Department of Basic Education [DBE], 2023). All changes were documented across both cycles in the National Adaptation Forms (NAFs). The protracted translation process during the COVID-19 pandemic ensured rigour and DBE sign-off on all 11 languages. Both cycles followed the standard operating procedures as set out by the IEA regarding the instrument translation and adaptation. As part of these procedures, South Africa, along with other participating countries, submitted their instruments for translation verification (von Davier et al., 2023).

2.4 Data collection procedures

Before the main data collection could occur, both PIRLS Literacy 2016 and PIRLS 2021 cycles required extensive fieldwork preparation.

2.4.1 Field trial preparation

Before the main data collection, both PIRLS cycles required extensive field trial preparation. All participating countries where English is the language of the test formed part of the field trial (Combrinck et al., 2017; Department of Basic Education [DBE], 2023; Von Davier et al., 2023). During the field trial, all English-speaking participating countries tested the materials in English. The field trial was conducted to provide item statistics and properties of new passages and questions. One of the main aims of the field trial was to identify problematic passages or questions in the test booklets and background questionnaires. Another main aim was to simulate the logistics of the main PIRLS study; by doing so, it assisted the different participating countries to identify possible issues relating to logistics, the test materials, or any other issue that might not be captured in the standard operating procedures. In addition to these aims, the field trial also assisted with test procedures, specifically with booklet assembly (Department of Basic Education [DBE], 2023).

2.4.2 Main data collection logistics

The main data collection for PIRLS Literacy 2016 and PIRLS 2021 differed, primarily due to contextual disruptions. Before the main data collection for PIRLS Literacy 2016 could take place, all testing materials were printed, and a fieldwork company was appointed. The fieldworkers were trained by the Centre for Evaluation and Assessment (CEA) based on the IEA training procedures. One fieldworker and a monitor were allocated to each participating class. The training included a review of the test administration manual, in-person practice with the achievement booklets and contextual questionnaires, and other test instructions (Combrinck et al., 2017). One of the major challenges faced in the main data collection was recruiting a vendor with enough qualified and bilingual fieldworkers. For example, the fieldworkers should be proficient in at least English and one African language or Afrikaans. In terms of packaging the test materials, the CEA recruited packing assistants who were trained according to standard IEA procedure to pack the boxes. Each box was prepared, labelled and assigned a colour depending on the province. One of the CEA quality control officers checked each box using the quality assurance checklist (Combrinck et al., 2017).

PIRLS 2021 was unexpectedly halted due to the COVID-19 pandemic in March 2020. During this period, the IEA and NRCs discussed how data should be collected, taking into consideration safety restrictions put into place by the participating countries (Mullis et al., 2023). A decision was made to collect the PIRLS 2021 data in three waves, depending on each participating country's safety restrictions. South Africa collected data in August–December 2021. Before the data collection took place, the training sessions were held online and covered test administration, manual use, practice scenarios, and troubleshooting. The recordings were shared with the service provider (Nexia SAB&T) and DBE officials. Regarding the data collection for PIRLS 2021, similar protocols (Johansone, 2023) were observed to those of the PIRLS Literacy 2016 assessment. Similar protocols include training, preparing, and packing boxes according to the standard operation procedure,

quality control measures, and data collection. However, the test administration faced problems such as school closures, physical presence of students, and return visits to schools (Department of Basic Education [DBE], 2023). The COVID-19 pandemic affected the data collection to a limited extent, and South Africa retained a high participation rate (Department of Basic Education [DBE], 2023).

3 Operational challenges and innovations in implementing ILSAs in South Africa

Over the years, the South African national testing centre has contended with logistical challenges such as inadequate infrastructure in rural schools, resource shortages, and schools located in remote areas. During the last two cycles of PIRLS in South Africa, additional constraints were experienced.

3.1 Translation constraints

Regarding the translation of the PIRLS instruments, both achievement booklets and contextual questionnaires into the remaining 10 official languages are complex. The complexity is attributed to differences in linguistic structures, the necessity of preserving text equivalence, and item difficulties for comparability (see Roux, 2020). During PIRLS Literacy 2016, an external certified translation company was contracted by the CEA to conduct the translations and adaptations from US-English to UK-English. The translation company was responsible for the forward-and back-translations within a six-week deadline in order to meet the international timeframes (Howie et al., 2017). Grade 4 teachers were recruited to review the passages and make suggestions for readability and appropriateness. The final translated instruments were sent to the IEA for international language verification. Comments and suggestions from the IEA were implemented, ensuring strict and transparent translation protocols were observed.

During the 2021 cycle, the translation process took on a more consultative approach where the translators, the CEA, and the DBE worked together to ensure all new passages and items were translated fairly. Due to the pandemic restrictions, the translation process took place online via online consultations and webinars. The online translation sessions included training for translators according to IEA protocol and standards, as well as instructions and guidance to complete the NAFs. The translated instruments, together with the NAFs, were provided to the IEA. Similar to the 2016 cycle, the IEA conducted an international language verification where comments were provided. A five-step translation protocol was adopted: (1) forward translation from the source language (i.e., English) to the target languages (i.e., 10 other official languages), (2) back-translation from the target language back to the source language, (3) professional revision of forward and back-translations, (4) DBE consultations and language experts, and (5) reconciliation against the source text to address any inconsistencies (see Department of Basic Education [DBE], 2023, p. 18). The meticulous translation process entailed that every language version, that is, translated text, underwent extensive quality checks before printing.

3.2 Logistical constraints and adaptive scheduling

The PIRLS Literacy 2016 test administration in South Africa encountered three substantial logistical hurdles: a compressed international timeframe, local socio-political events, and a national assessment. The late release of the international assessments left only 6 weeks for the contextualisation, translation, back-translation, verification, formatting and layout of the achievement booklets and contextual questionnaires in the 10 official languages, a process that normally requires several months. The shorter timeframe was described as “exceptionally challenging” (Howie et al., 2017, p. 39). During October–November 2015, and again in January 2016 the University of Pretoria, including the CEA, was closed due to the ‘Fees-Must-Fall’ student protest action (Luescher et al., 2022), which resulted in a loss of approximately 3 weeks of preparatory work, necessitating the rescheduling of printing, packing and distributing (Howie et al., 2017) of the achievement booklets, contextual questionnaires and other testing materials. Moreover, the forced closure also necessitated rescheduling of testing. The Annual National Assessments (ANAs) were unexpectedly implemented in December 2015, which further prevented the South African team from completing the data collection. This delay resulted in the data collection only being finalised in 2016, however, only after the second wave of ‘Fees-Must-Fall’ protest action took place (Howie et al., 2017). The South African NRC at the time stated, “... 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” (Howie et al., 2017, p. XV).

In contrast to the PIRLS Literacy 2016 cycle, where only 6 weeks were provided for translations and finalisation of instruments, the PIRLS 2021 cycle benefited from a pre-pandemic decision to test during August–December 2021. This decision granted the South African team additional time for rigorous translation processes and verification (Department of Basic Education [DBE], 2023). Nevertheless, the COVID-19 pandemic introduced novel logistical challenges, in particular rotational attendance policies, safety measures and school closures (Department of Basic Education [DBE], 2023; Mullis et al., 2023). Rotational attendance policies in schools meant that only half of the students were present on the initial visit to the schools, and this may have contributed to the decline in the average scores between the two PIRLS cycles (Böhmer and Wills, 2023). These policies required the test administrators to schedule follow-up visits to the schools to complete the assessment. In some instances, where the school had available infrastructure to test the group on the same day, but adhering to social distancing, additional fieldworkers were deployed to ensure the test administration was conducted according to set protocols. During the pandemic, the provincial coordinators from the DBE played a crucial role in mediating these rapid changes in the schedule, liaising between the fieldwork service provider (Nexia SAB&T) and school management to ensure high participation rates (Department of Basic Education [DBE], 2023). By using adaptive scheduling practices, such as identifying return visits and maintaining a flexible fieldwork roster, the CEA was able to adhere to international timeframes despite the uncertainty of the pandemic and the disruptions faced by many schools across the country.

3.3 Recruitment and training of test administrators

When any large-scale assessment is undertaken, the importance of test administrators should be underscored. In South Africa, with its diverse cultural and language groups, the recruitment of test administrators posed another challenge for both PIRLS Literacy 2016 and PIRLS 2021 (Department of Basic Education [DBE], 2023; Howie et al., 2017). For 2016, the pool of data collection companies with experience in educational settings, with fieldworkers who are extensively familiar with the South African school system, was limited. In addition, due to the number of languages assessed, the fieldworkers were also required to be fluent in English and the language of the test. Other than the IEA requirements for test administrators, the CEA also struggled to secure an external data collection company that met all the requirements of the University of Pretoria (Howie et al., 2017). Although the PIRLS Literacy 2016 training procedures are not public, the high level of inter-rater reliability in scoring suggests that fieldworkers and scorers received intense training from the CEA (see Howie et al., 2017, pp. 40–41).

Due to the COVID-19 restrictions, the PIRLS 2021 recruitment and training of test administrators were completed differently than in the previous cycle. For PIRLS 2021, travel restrictions and other safety measures, such as social distancing, mandated a virtual training model. Between 18 and 21 August 2021, DBE officials and fieldworkers attended webinars covering the PIRLS framework, test administrator role, test administrator manual, preparation before testing, different test materials, timing of test sessions and post-test procedures (Department of Basic Education [DBE], 2023). The webinars included practice scenarios and group exercises to ensure that the test administrators are fully trained for the main data collection across the country. These webinars were recorded and made available for review by the data collection service provider (Nexia SAB&T) and DBE officials (Department of Basic Education [DBE], 2023). Using a range of recorded webinars for training, which placed emphasis on practice, ensured a comprehensive coverage of IEA protocols and standards despite the lack of in-person training.

4 Discussion

South Africa’s participation in the two most recent PIRLS cycles reveals both commendable advancements and persistent challenges in educational measurement (see Department of Basic Education [DBE], 2023; Howie et al., 2017). The South African experience offers valuable lessons in the administration of ILSAs in complex, multilingual, and resource-constrained settings.

A pressing need is the development of sustained local capacity for managing and implementing ILSAs. The DBE was absent from the PIRLS Literacy 2016 assessment in terms of oversight and coordination (Howie et al., 2017), which may have been valuable, especially during the ‘Fees-Must-Fall’ movement. Improved collaboration was observed in PIRLS 2021, where the DBE and provincial coordinators assisted greatly during the pandemic to ensure high participation rates and real-time monitoring (Department of Basic Education [DBE], 2023). These assessments underscore the importance of institutional continuity, clear oversight mechanisms, and embedded capacity.

Moreover, challenges identified across both cycles point to technical gaps in key areas. For instance, sampling complexities, inconsistencies in translation quality across African languages, and the need for stronger psychometric oversight have been documented in PIRLS national reports (Department of Basic Education [DBE], 2023; Howie et al., 2017) and independent analyses (see Mthimkhulu et al., 2024; Mtsatse and van Staden, 2021; and Roux et al., 2022). These operational and methodological issues highlight the need for a national assessment hub with expertise in sample design, psychometrics, translation, and fieldwork logistics. Such a hub would preserve institutional memory, promote continuous improvement, and reduce dependence on short-term consultants (Clarke and Luna-Bazaldúa, 2021).

Ensuring linguistic equivalence of PIRLS test instruments across the source language and the target languages must be treated as a non-negotiable priority. Current protocols and standards, while rigorous, require deeper cultural-linguistic input. Scholars such as Mthimkhulu et al. (2024), Mtsatse and van Staden (2021), and Roux et al. (2022) examined the PIRLS achievement instruments within the South African context and indicated that these instruments should be refined and African language speakers, such as teachers, must form part of the translation process. A national translation and terminology bank should be developed in collaboration with African language educators and experts, which would support both ILSAs and national assessments. Pre-testing and piloting of translated instruments prior to the main data collection should be mandated to identify any inconsistencies.

In summary, the last two PIRLS cycles in South Africa demonstrated considerable agility in the face of substantial hurdles: narrow preparation time and socio-political unrest during PIRLS Literacy 2016 and a global pandemic during PIRLS 2021. Through adaptive scheduling, innovative online training, multi-step translation protocols and psychometric quality assurance, the CEA and DBE have put into place safeguards for future ILSAs in the country. These strategies offer insights into ILSAs within a multilingual, multicultural, resource-constrained setting, again emphasising the need for stakeholder collaboration and robust monitoring systems. While the analysis draws primarily on institutional sources, future research could be strengthened by incorporating additional perspectives from independent stakeholders involved in assessment implementation.

While rooted in the South African experience, the challenges and adaptive strategies described here are not unique to South Africa. Countries with similarly complex linguistic landscapes may also experience issues with translation accuracy and limited psychometric

capacity. The South African model of embedding national oversight, engaging language experts (including teachers), and developing locally grounded quality assurance protocols may offer a blueprint for other systems navigating the administration of ILSAs under constrained conditions.

Data availability statement

The original contributions presented in the study are publicly available. This data can be found here: <https://pirls2021.org/data/>.

Author contributions

KR: Conceptualization, Writing – review & editing, Writing – original draft.

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