

**Unpacking reading comprehension strategies and how teachers
teach reading in Grade 4**

by

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Declaration

I, SUNE BESTER, declare that the dissertation, which I hereby submit for the degree **MEd in Assessment and Quality Assurance in Education** in the Department of Science, Mathematics and Technology Education at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.”

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Dedication

I dedicate this research to my husband, *Constant Bester*, for all his patience, love, and support through this journey.

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Abstract

This study aims to examine and understand the possible relationship between reading instruction strategies and Grade 4 reading literacy using the PIRLS Literacy 2016 data specifically the PIRLS processes of comprehension. When teachers deliberately use different teaching strategies, with the support of the Department of Basic Education, this could help to improve learners' reading comprehension. As measured on two scales namely, Straightforward inference scale and the Interpret and Integrate Ideas and information scale, this study focused on specific variables from the PIRLS Literacy 2016 South Africa study, from the teacher and school questionnaires. Secondary data analysis was used with multiple regression analysis to measure the relationship between the reading literacy instructional strategies and Grade 4 reading literacy achievement. This study used the PIRLS 2011 framework as the conceptual framework for this study. This framework aims to give a clear understanding of how the different reading instructional strategies affect learners within the classroom and school context. This study found that one reading strategy, Determine the author's perspective or intention, was statistically significant for both the scales of reading achievement. This study highlights the important role learners' socio-economic status plays in their day-to-day education.

Key Terms:

PIRLS Literacy 2016, reading instruction strategies, Grade 4, reading literacy achievement, processes of comprehension, reading comprehension.

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List of acronyms

ANA	Annual National Assessments
CAPS	Curriculum and Assessment Policy Statement
CEA	Centre for Evaluation and Assessment
DBE	Department of Basic Education
DPC	Data Processing Centre
IDB	International Database Analyzer
IEA	International Association for the Evaluation of Educational Achievement
PIRLS	Progress in International Reading Literacy Study
prePIRLS	PreProgress in International Reading Literacy Study
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
SES	Socio-economic status
TIMMS	Trends in International Mathematics and Science Study

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Chapter 1 - Introduction

1.1 Introduction

The main purpose of the study was to examine and understand the possible relationship between reading instruction strategies and Grade 4 reading literacy by means of the Progress in International Reading Literacy Study (PIRLS) Literacy 2016 data, with specific reference to the PIRLS processes of comprehension. Reading instruction strategies entails the use of strategies to enable learners to conduct reading comprehension tasks and comprehend different texts. The PIRLS study focuses on the achievement of young learners in their fourth year of schooling, as well as their home and school experiences of learning to read (Mullis & Martin, 2013). The reason the PIRLS study assesses learners in Grade 4 is that it is an important transition point in the development of learners as readers (Mullis & Martin, 2013) where learners move from learning to read to reading, and on to learning (Zimmerman, 2010). The PIRLS Literacy 2016 data was used in this study because it was the last international PIRLS assessment conducted and is the most pertinent PIRLS data. The next PIRLS Literacy study will be conducted in 2021, but the data will only be available to the public in December 2022 (IEA, 2021).

PIRLS Literacy assesses learners' abilities to undertake different reading comprehension processes (Howie, et al., 2017). The original test was adjusted to make it more accessible to the South African learner. Hence, the reading processes – while still ranging from a lower to higher order – are tested in less difficult texts than those found in the PIRLS main study. This is important because the difficulty of a higher-order item is affected by the item difficulty spread of the test itself, as Palane (2018) demonstrated by using the prePIRLS 2011 reading texts and data. The cognitive processes tested include “*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*” (Howie, et al., 2017, p. 6). “PIRLS assesses four broad-based cognitive processes of comprehension typically used by Grade 4 readers” (Howie, et al., 2017, p.20). “These processes are undergirded by metacognition strategies and processes, which allow readers to evaluate their own understanding and regulate their use of different reading strategies” (Howie, et al., 2017, p.20). The study investigated whether the use of different reading strategies aided in the development of both lower-order and higher-order reading comprehension. The research focused specifically on how inferential processes are developed, since this process may be foundational for further development of higher-order

comprehension. Palane (2018) further suggests that teaching higher-order reading comprehension to L2 (a learner's first additional language or second language) as the first step may require an emphasis on inferencing to comprehend the abstract text.

The teacher questionnaires include data about teaching strategies and skills that teachers use in the classroom to teach the learners reading comprehension (Mullis & Martin, 2013). Nine skills and strategies were emphasised in the teacher questionnaires. These skills and strategies are:

- 1) *Locate information within the text,*
 - 2) *Identify the main ideas of what they have read,*
 - 3) *Explain or support their understanding of what they have read,*
 - 4) *Compare what they have read with experiences they have had,*
 - 5) *Compare what they have read with other things they have read,*
 - 6) *Make predictions about what will happen next in the text they are reading,*
 - 7) *Make generalizations and draw inferences based on what they have read,*
 - 8) *Describe the style or structure of the text they have read,*
 - 9) *Determine the author's perspective or intention.*
- (Howie, et al., 2017, p.132).

On home-language level, the Curriculum and Assessment Policy Statement (CAPS) emphasises reading comprehension on the lower-order and higher-order cognitive levels (Department of Basic Education [DBE], 2011). In addition, both home language and additional language options set the same requirements for both cognitive levels in terms of the percentage of reading comprehension assessments (Howie, et al., 2017). This study utilised the data for Afrikaans home language and English second language (or first additional language). Reading instruction strategies can develop lower and higher-order cognitive categories. Soto, et al. (2019) state that higher inferential abilities are linked to reading comprehension. Greenfield (2012) says that reading instruction embodies several different applications and skills that must be used by learners in order to reach the main purpose: achievement of learner reading comprehension in terms of lower and higher-order processes. Lastly, teachers must implement a variety of strategies in order to expand learner skills and obtain engagement (Greenfield, 2012).

1.2 Rationale

This study aims to illustrate that deliberate reading instruction can affect learners' performance in lower and higher-order reading comprehension. Teachers' deliberate use of instructional strategies congruent with what the Department of Basic Education

envisages may provide fertile ground for improved reading comprehension. Of the nine reading comprehension strategies tested in the PIRLS Literacy 2016 Study, the three most frequently used by teachers were How to locate information within texts, identify main ideas, and explain or support the learner's understanding of what they have read (Howie et al., 2017). The Curriculum and Assessment Policy Statement (CAPS) states that all learners must be taught different strategies to help them decode the written text and read with understanding (Department of Education, 2012). Furthermore, CAPS requires learners to know how to locate and use different information, follow an argument or process, be able to make summaries, develop their own understanding, and demonstrate and adapt what they learn from what they read (Howie et al., 2017). Learners are also required to learn to interpret pictures and other graphic materials and make sense of visual and multimedia texts (Howie et al., 2017). In the PIRLS Literacy 2016 Study, four broad-based comprehension processes are integrated within two purposes namely, "reading for literary experience and reading for the use and acquisition of information" (Howie et al, 2017, p.34) for reading. These are to "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 & Martin, 2013, p. 13). Each of these processes include many of the CAPS skills as discussed here.

The keys to successful learning across the curriculum are well-developed viewing and reading skills (Department of Education, 2012). Learners become more proficient readers by viewing and reading a wide variety of non-literary and literary texts, including visual texts (Department of Education, 2012). Literary and non-literary texts as well as visual texts are just some of the resources used in classrooms. Howie et al. (2017) state that, in terms of resources, only half of the South African schools tested in the PIRLS Literacy 2016 Study had adequate resources in terms of instructional materials. There were also problems with the provision of learning material and textbooks (Howie, et al., 2017). Lack of access to text affects the development of higher-order reading comprehension in second-language learners in South Africa (Palane, 2018).

Klapwijk and Van der Walt (2011) argue that teachers rarely teach reading instruction strategies explicitly, which means that learners are deprived of the strategies they need to think about in the process of making meaning when encountering texts. Klapwijk (2011), adding to Klapwijk and Van der Walt (2011), states that teachers are not adequately trained in different reading instruction strategies that would enable them to apply the appropriate methods in the classroom. In 2015, the Department of Basic Education launched a programme called the Early Grade Reading Study (EGRS). The vision and mission of this

study was to focus on Goal 16 of the Action Plan to 2019: Towards the Realisation of Schooling 2030 “to improve the teachers' computer literacy, professionalism, teaching skills, and subject knowledge throughout their careers” (DBE, 2019). The first cycle of the study started in 2015 with three promising intervention models to help improve the reading outcomes in the learners' home language (Setswana) (DBE, 2019).

1.3 Problem statement

The fundamental reason for this study was to understand which reading instruction strategies used by Grade 4 teachers could be associated with better performance in reading comprehension and, more specifically, in the development of inferential reading comprehension. In the PIRLS Literacy 2016 Study, South African learners performed notably better in lower-order reading comprehension processes (retrieving and straightforward inferencing) than in higher-order reading comprehension processes (evaluating content and textual elements) (Howie, et al., 2017). South African Grade 4 learners scored very low on the overall 2016 PIRLS Literacy scale; this group achieved the lowest score of all 50 education systems that participated in the study (Howie, et al., 2017). The achievement score of South African learners in PIRLS Literacy 2016 was 320; 180 points lower than the average international benchmark of 500. According to Pretorius and Klapwijk (2016) and Howie et al. (2017), comprehension is the goal of reading instruction. Pretorius and Klapwijk (2016) suggest that teachers spend most of their instructional time on more basic reading strategies and skills and less time on more inferential types of skills, which would promote comprehension. Pretorius and Klapwijk (2016) found that poor reading outcomes suggest that basic reading skills of learners are not being properly developed. Reading comprehension is crucial for reading success (Howie, et al., 2017). In the PIRLS Literacy 2016 Study, four processes of comprehension form the basis for assessing comprehension. Learners require interpreting, integrating, and evaluating skills, which are crucial skills throughout their schooling career for effective reading comprehension (Howie et al., 2017). The PIRLS Literacy 2016 Study used nine reading comprehension skills and strategies in the study (Howie et al., 2017). These strategies are on different cognitive levels. Furthermore, the teacher questionnaires specifically asked about the reading strategies and skills emphasised during (at least weekly) reading instruction sessions in their classrooms (Howie et al., 2017). Lastly, three quarters of principals who participated in the PIRLS Literacy 2016 Study reported that half of the pupils in their school, sometimes more, came from economically disadvantaged homes (Howie, et al., 2017).

1.4 Aim and objectives of the study

The primary aim of this study was to determine the extent to which the application of specific reading instruction strategies affect learner reading comprehension achievement in the four processes of comprehension. Furthermore, this study also sought to determine how frequently teachers engage their learners in the nine reading literacy activities tested in the PIRLS Literacy 2016 Study. The final aim was to determine the relationship between the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study, and Grade 4 learner reading literacy achievement when controlling for school socio-economic status.

1.5 Research questions

The aim of this study was to determine the relationship between reading instruction strategies, and Grade 4 learner reading literacy achievement when controlling for socio-economic status for learners tested in the PIRLS Literacy 2016 Study. The study applied secondary data analysis to the data collected from the teacher and school questionnaires in the South African PIRLS Literacy 2016 Study. Only the items relevant to the research questions were used.

The study was guided by the following research questions:

1. To what extent do teachers' use of specific reading instruction strategies affect learner achievement in the reading comprehension process of evaluation?
2. What is the relationship between the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study and Grade 4 learner reading literacy achievement?
3. What is the relationship between the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study and Grade 4 learner reading literacy achievement when controlling for school socio-economic status?

In this research study, the individual scores of each of the comprehension processes are used to explain each of the research questions. The comprehension processes are used to convey the idea that achievement is not limited to overall achievement as an outcome variable, but each of the reading achievement scores for the processes of comprehension.

1.6 Research methodology

The methodology of this study is discussed under the following topics: 1) Epistemology of the study, 2) Methodological approach, 3) Research design, 4) Sampling, 5) Data collection and documentation, and 6) Data analysis and interpretation.

Epistemology in research is used to understand how people come to know something and how people know the truth or understand reality (Kivunja & Kuyini, 2017). The postpositivist paradigm was used to analyse and interpret the data in this study. The postpositivist paradigm in research is grounded in critical realism (Trochim, 2020). It is based on subjectivity and recognises that all observation is fallible, and all theory is revisable (Trochim, 2020). Most postpositivists are constructivists who believe that each person constructs their own view of the world based on their perceptions of it (Trochim, 2020). Postpositivism was considered most suitable for this study because each researcher constructs his/her own view of the world based on their perception(s) of it. Hence, the process is subjective and not objective as in the case of positivism. Postpositivism was also selected for this study because the constructed reality does not exist in a vacuum, but is influenced by different contexts, such as culture, gender, etc. (Nieuwenhuis, 2020). Postpositivist researchers focus on searching for evidence that is reliable and valid in terms of the existence of phenomena, rather than focusing on generalisation (Nieuwenhuis, 2020). Lastly, postpositivism was the lens used to analyse the quantitative 2016 PIRLS Literacy data.

The methodological approach used for this study was quantitative. Quantitative research can be defined as “a systematic and objective process that uses numerical data from a selected subgroup of a population to generalise the findings to the universe being studied” (Pietersen & Maree, 2020,p.184). Furthermore, the quantitative research approach was used in the secondary analysis of existing data. The South African data from the PIRLS Literacy 2016 Study was collected through teacher and school questionnaires to determine the different reading instruction strategies that teachers use to teach reading. Lastly, this research approach relates to postpositivism, the epistemological paradigm applied in this study.

The research design of this study was secondary data analysis. The data that was used was existing data from the PIRLS Literacy 2016 Study. Secondary data analysis is a systematic research method that utilises data that has been collected, compiled, and archived, and is accessible to other researchers (Johnston, 2014). Thus, data reused by another researcher makes it possible to elaborate on the data (in this instance the PIRLS

Literacy 2016 Study data) and draw further information relevant to a different research question. The PIRLS Literacy 2016 Study data was used in this study because reading literacy data had already been collected in South African schools by other researchers. This made it possible for the researcher to draw relevant and reliable conclusions about the reading literacy achievement of South African learners.

The sample in this study was the participants who originally participated in the PIRLS Literacy 2016 Study. “Grade 4 learners in South Africa were selected as the population for the original study” (Howie et al., 2017, p.31). The PIRLS Literacy 2016 Study cycle data was stratified by province and language (Howie et al., 2017). A two-stage stratified random cluster design was implemented in the study (Howie et al., 2017). Furthermore, a random sample of South African schools was selected to represent the different languages and provinces (Howie et al., 2017). There were 304 schools selected to represent South Africa, and a total of 339 Grade 4 classes were selected for participation in the PIRLS Literacy 2016 Study. However, after contacting the schools, only 293 schools and 324 classes were eligible for participation (Howie et al., 2017). The sample of learners that were selected to represent South Africa for the Grade 4 PIRLS Literacy 2016 Study was 12 810 learners (Howie et al., 2017). Lastly, the “sample was not specifically selected based on quintiles” (Howie et al., 2017, p.93), as the different quintiles were not being studied.

This study applied a quantitative research approach with a secondary data analysis design applied to the 2016 PIRLS Literacy data. The collection and documentation of the PIRLS Literacy 2016 Study is discussed. The reading literacy of the Grade 4 learners was “measured with the use of informational and literary texts” (Howie et al., 2017, p.38) in the test booklets. Four contextual questionnaires were used in the PIRLS Literacy 2016 Study. The teacher and school questionnaires were used in this study. The teacher questionnaires contain items that “shed light on the factors associated with reading comprehension” (Howie et al., 2017, p.38). Furthermore, the questionnaires for teachers were used to find out what reading instruction strategies were used in the classroom (Howie et al., 2017). This study employed the data from the PIRLS Literacy 2016 Study and items in the teacher and school questionnaires related to reading instruction strategies and the process of comprehension. The table in appendix B is a summary of the variables that were used to collect data from the PIRLS Literacy 2016 Study teachers’ questionnaires.

This study utilised descriptive statistics, regression analysis factor analysis and multiple regression analysis. Descriptive analysis helps to describe and show data in a meaningful way to provide summaries about the sample and the measures (Trochim, 2020).

Regression analysis is a mathematical sorting method to identify which variables have an impact on one another (Gallo, 2015). Multiple regression analysis is defined as a “statistical tool used to model the relationship between a dependent variable” (reading literacy achievement) and one or more independent variables (nine reading instruction strategies) (Soto, 2013). “Regression analysis describes how the typical value of the dependent variable changes when one of the independent variables increases or decreases, while the other independent variables remain constant” (Soto, 2013). The IDB data analyser was the software used to analyse and interpret the data (IEA, 2020). The IDB data analyser is a software tool that is used to combine and analyse data from all the International Association for the Evaluation of Educational Achievement’s (IEA’s) large-scale assessments (IEA, 2020). Lastly, the study made use of regression analysis to measure the relationship between reading instruction strategies and Grade 4 learner reading literacy achievement in those who participated in the 2016 PIRLS Literacy Test.

1.7 Structure of the dissertation

In **Chapter 2**, various definitions of reading literacy are discussed, and the concept is contextualised. The International Association for Evaluation of Educational Achievement (IEA) is discussed. Background about the PIRLS studies from 2006-2021 are elaborated on, as is the reading instruction strategies used in the PIRLS studies of 2006-2016. The contexts of the learners who participated in the PIRLS Literacy 2016 Study are provided. Finally, the assessment framework and instruments used in the PIRLS Literacy 2016 Study are discussed.

Chapter 3 is the literature review for the current study and gives an in-depth overview of reading instruction, reading literacy achievement, and reading comprehension. This includes a discussion of reading strategies, the 2011 and 2016 PIRLS framework for learner reading literacy achievement, the processes of evaluation, the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study, the relationship between reading instruction strategies and reading literacy achievement and, lastly, the impact of reading instruction strategies on the achievement of reading comprehension. Furthermore, socio-economic status in the current study is elaborated on and the conceptual framework for the study is outlined.

Chapter 4 consists of the methodology of the current study. It outlines and discusses the epistemological assumptions, methods and design, sample, data source, alignment of

instruments to research questions and framework, data analysis, validity and reliability, and the ethics of the current study.

Chapter 5 contains an analysis of the data used in the study. This chapter discusses the descriptive results for the instruction and experience variables, time on task/hours spent on instruction variables, the difficulties understanding the spoken language of the test variables, and the classroom variables. Furthermore, the socio-economic status and nine reading instructional strategy variables chosen for the study that represents the process dimension of the PIRLS Framework are elaborated on. The reliability results, factor analysis results, and multiple regression analysis results are also explained.

Chapter 6 is a summary of the current study. The results are motivated and the importance of reading in Grade 4 is highlighted. The sub-questions are discussed, and the chapter concludes with reflections and recommendations for further studies.

Chapter 2 - Background of the Progress in International Reading Literacy Study (PIRLS)

2.1 Introduction

Since the year 1958, the International Association for the Evaluation of Educational Achievement has led the way in conducting comparative studies of educational achievement worldwide (Hastedt, 2018) and became a legal entity in 1967 (IEA, 2023). Not many researchers in Germany were interested in international large-scale surveys between 1970 and 1980 (Schwippert, 2018). The IEA started as an international, non-government organisation that undertook international studies to benchmark the performance of school-going learners in civic education, communication, information, mathematics, reading, science, and technology (Van Staden et al., 2019). Since then, the IEA's mission has been to improve the quality of education through its different studies (Howie et al., 2017). The IEA membership started with 12 educational research institutions and has grown to 62, ranging from ministries of education to universities, each representing its own country (Howie et al, 2017).

The Progress in International Reading Literacy Study (PIRLS) can be described as an international assessment system that assesses the quality of comprehension and reading of primary school learners in different countries once every five years (Egamberdiyevna, 2022). PIRLS is also a cross-cultural and cross-lingual study with more than 50 participating countries worldwide (Roux et al., 2022). "PIRLS 2016 is the fourth assessment in the current trend series" (Howie et al., 2017, p.XIII). It is the third study that South Africa participated in (Howie et al., 2017). The Centre for Evaluation and Assessment (CEA) at the University of Pretoria conducted the last three studies – PIRLS 2016, 2011, and 2006 – in South Africa, "under the auspices of the International Association for the Evaluation of Educational Achievement (IEA)" (Howie et al., 2017, p.XIII).

The remainder of this chapter provides details about the history of PIRLS studies. The PIRLS assessment framework is presented in section 2.3, followed by the PIRLS data collection instruments in section 2.4. The design of PIRLS Literacy 2016 is presented in section 2.5 and the sample in section 2.6. The validity and reliability of the PIRLS study are presented in section 2.7, and 2.8 contains a summary of the chapter.

2.2 A short history of PIRLS

In 1991, the first international comparative reading literacy study was initiated by the IEA with 32 participating education systems (Howie et al, 2008). In 2001, the PIRLS Study was followed by 35 participating countries (Howie et al, 2008). The PIRLS 2006 represented the third study of its kind under the auspices of the IEA (Howie et al, 2008). Furthermore, the study enabled countries that participated in 1991 and 2001 to identify long-term trends over a specific period as well as monitor their system's developments in education and reading (Howie et al, 2008). All three studies focussed on the two purposes for reading PIRLS 2006, which were "reading for literary experience and reading to acquire and use information" (Howie et al, 2016, p.34). The target populations tested in 1991, 2001 and 2006 were Grade 4s in most countries (Howie et al, 2008).

The CEA in South Africa established the PIRLS 2006 project in 2004 (Howie et al, 2008) and in early 2005, "the Minister of Education and Heads of Education Departments Committee (HEDCOM)" gave permission for this study (Howie et al, 2008, p.2). To formally embark on this study, "funding was acquired from the National Research Foundation" and the Royal Netherlands Embassy in 2005 (Howie et al, 2008, p.2). A sample of 38 schools participated in the pilot study in May 2005 (Howie et al, 2008). The main study was conducted in the months of October and November of 2005, with the last schools tested in January 2006; 441 schools participated in the main study (Howie et al, 2008). The testing of Grade 4 and 5 learners was conducted in all 11 official languages, and the contextual questionnaires were completed by principals, teachers, parents, and learners (Howie et al, 2008). A national assessment in English reading, based on the South African curricula, was administered to Grade 4 and 5 learners (Howie et al, 2008). In 2006, the data were submitted to the International Data Processing Centre in Hamburg, Germany, after it had been captured and cleaned (Howie et al, 2008). The South African researchers received the final international data in mid-September of 2007 (Howie et al, 2008).

The PIRLS 2011 study was the fourth in a series of different international comparative studies initiated by the IEA that focused on reading literacy (Howie et al, 2012). This study was conducted in 2010 and 2011 with 325 000 students in South Africa and 49 other countries (Howie et al, 2012). Furthermore, 35 countries participated in PIRLS 2011 and this study was the third in a series of trend studies that had started 10 years earlier, in 2001 (Howie et al, 2012). "PIRLS 2011 enabled countries that had also taken part in the 2001 and 2006 studies to identify long-term trends and monitor their systems' developments in education and reading over an extended time" (Howie et al, 2012, p.1). PIRLS 2011

introduced a new assessment for countries whose performance in the previous studies had been low, with the majority of the sample in the South African study being Grade 4 learners (Van Staden et al., 2019). PreProgress in International Reading Literacy Study (prePIRLS) was an easier assessment used to collect information at the Grade 4 level in 11 languages; this study was conducted only in South Africa, Colombia, and Botswana (Howie et al, 2017). This new prePIRLS study provided learners from lower-achieving countries with the opportunity to participate at an adjusted level to ascertain their levels of reading literacy (Howie et al, 2012). PrePIRLS is an easier, shorter test aimed at a lower cognitive level (Van Staden et al., 2019). Almost 20 000 learners in Grades 4 and 5 from more than 400 different schools in South Africa participated in the PIRLS 2011 study (Howie et al, 2012). “South African Grade 4 learners participated in prePIRLS in all 11 official languages, while Grade 5 learners were tested in Afrikaans or English” (Howie et al, 2012, p.74). PIRLS 2006, 2011 and prePIRLS results in South Africa showed the extent of learners’ difficulties with reading literacy achievement (Van Staden et al., 2019).

2.3 PIRLS Literacy 2016 assessment framework: Contexts for learning and processes of comprehension

In the PIRLS studies, an assessment framework is developed to provide researchers with a guideline for assessing reading comprehension at Grade 4 level by using a matrix of two reading purposes (literary and informational) by four comprehension strategies (Mullis and Martin, 2019). The PIRLS studies keep pace with the times and improve the assessment framework and criteria in accordance with modern requirements (Egamberdiyevna, 2022). Experts in curriculum assessment and reading education from national educational centres from around the world contributed to the development of the assessment frameworks from each PIRLS study (Herget et al, 2019). The PIRLS 2016 study represents a significant change in PIRLS up to 2016, because it introduces two new levels of reading comprehension assessment, namely ePIRLS and PIRLS Literacy (Mullis & Martin, 2015). “ePIRLS is a computer-based assessment that uses an engaging, simulated Internet environment to present fourth grade students with authentic school-like assignments involving science and social studies topics” (Mullis et al., 2017, p.3).

The PIRLS Literacy assessment was developed to be equal in scope to the PIRLS assessment; it reflects the same understanding of reading, but is less difficult overall (Mullis & Martin, 2015). The assessment framework for PIRLS Literacy was specifically compiled to “determine how well learners read different types of texts, which include non-fiction

(informational) and fiction (literary)” (Howie et al, 2017, p.69). Half of the texts that were used were non-fiction and the other half were fiction (Howie et al, 2017). The passages in the PIRLS Literacy 2016 Study are shorter, and it tends “to comprise more straightforward inference questions that give the researchers the opportunity to study the reading literacy development of the learners at the lower end of the reading comprehension scale” (Howie et al, 2017, p.69).

The four comprehension strategies are to “focus on and retrieve explicitly stated information, make straightforward inferences, interpret and integrate ideas and information, and evaluate and critique content and textual elements” (Howie et al, 2017, p. 6). These four strategies serve as the basis when items are developed to accompany every reading passage in the PIRLS study booklets (Zukerman et al., 2018). The four processes are undergirded by metacognitive strategies and processes that allow the readers to understand, regulate and evaluate their use of reading strategies (Mullis & Martin, 2019). The reader should employ a variety of different reading strategies in order to achieve higher-order reading comprehension (Mullis & Martin, 2019).

The four comprehension processes in the PIRLS assessments “are used as a foundation for the development of the comprehension questions, which are based on each set of passages or reading passages” (Mullis & Martin, 2019, p.12). The variety of the questions measures the range of comprehension processes across each assessment and enables learners to “demonstrate a range of skills and abilities in constructing meaning from the written texts” (Mullis & Martin, 2019, p.12). With each of the processes and their components, examples of questions are discussed that may be used to assess each of the processes (Mullis & Martin, 2019). When reflecting on assessment questions, there is an essential interaction between the complexity and length of the text and the refinement of the required comprehension processes (Mullis & Martin, 2019). In the beginning, it may seem less difficult to explicitly locate and extract information than, for example, to make interpretations in a full text and to integrate information with external ideas and experiences (Mullis & Martin, 2019). However, not all texts are equal and may vary in the abstraction of ideas, organisational structure, syntactic complexity, and length (Mullis & Martin, 2019). Therefore, the nature of the text has an impact or can affect the difficulty of each question asked within and across the four processes of comprehension (Mullis & Martin, 2019).

Reading strategies are assumed to be important for learners’ reading comprehension (Banditvilai, 2020). Furthermore, the reading strategies equip the learners with the relevant skills to handle their reading effectively. Ozturk and Aydogmus (2021) explained that

reading strategies enable learners to become more active in their own comprehension process and reading, which can encourage them to make more conscious, informed, and critical readings, and so improve their interest and attitudes towards reading. Howie et al. (2017) add and explain that higher-order reading comprehension is promoted in the learner's reading skills when using reading strategies. The reading strategies should support the process of each reader; thus, they should support the lower-order or higher-order process of reading.

2.3.1 Reading instruction strategies surveyed in PIRLS 2006

In the PIRLS 2006 study, different reading instruction strategies were surveyed. The seven reading instruction strategies that were used in the PIRLS 2006 study can be found in the Teacher Questionnaire of the study (2005) and are:

- a) identify the main ideas of what they have read, b) explain or support their understanding of what they have read, c) compare what they have read with experiences they have had, d) compare what they have read with other things they have read, e) make predictions about what will happen next in the text they are reading, f) make generalisations and draw inferences based on what they have read and g) describe the style or structure of the text they have read (p.8).

2.3.2 Reading instruction strategies surveyed in PIRLS 2011

In the PIRLS 2011 study, different reading instruction strategies were surveyed. The nine reading instruction strategies that were used in the PIRLS 2011 study can be found in the teacher questionnaire of the study (2011):

- a) locate information within the text, b) identify the main ideas of what they have read, c) explain or support their understanding of what they have read, d) compare what they have read with experiences they have had, e) compare what they have read with other things they have read, f) make predictions about what will happen next in the text they are reading, g) make generalisations and draw inferences based on what they have read, h) describe the style or structure of the text they have read and i) determine the author's perspective or intention (p.11).

2.3.3 Reading instruction strategies surveyed in PIRLS Literacy 2016

In the PIRLS 2016 study, additional reading instruction strategies were surveyed. The nine reading instruction strategies that were used in the PIRLS 2016 study can be found in Howie et al. (2017) and are:

- a) locate information within the text, b) identify the main ideas of what they have read, c) explain or support their understanding of what they have read, d) compare what they have read with experiences they have had, e) compare what they have read with other things they have read, f) make predictions about what will happen next in the text, g) make generalizations and draw inferences, h) describe the style or structure of the text and i) determine the author's perspective or intention (p.132).

In the PIRLS Literacy 2016 Study, four broad-based cognitive comprehension processes typically used by fourth-grade readers were assessed (Howie et al, 2017). These processes can be further defined by the process and strategies of metacognition, which “allow readers to evaluate their understanding and regulate their use of reading strategies” (Howie et al, 2017, p.20). The cognitive strategies are mental and behavioural activities (Howie et al, 2017). During the use of “cognitive strategies, the learners use existing knowledge, make use of re-reading, and alter their reading speed to aid their comprehension” (Howie et al, 2017, p.20). Zhang and Guo (2020) add to Howie et al. (2017) by arguing that, in reading, cognitive strategies are directly related to the target language and the learners' world of knowledge; this allows the learners to construct meaning from a text and perform given tasks. Furthermore, Zhang and Guo (2020) state that cognitive strategies include summarising, linking with prior knowledge or experience, translating, guessing meaning from contexts, making predictions, and applying grammar rules. Meta-cognitive strategies are related to self-regulation or self-management in each reading activity (Zhang & Guo, 2020). In meta-cognitive strategies, monitoring and planning strategies are included (Zhang & Guo, 2020). Monitoring strategies are the learners' actions of checking, monitoring, and evaluating their reading and thinking performances (Zhang & Guo, 2020). Planning strategies are the learners' actions of what, when, and how a task needs to be done (Zhang & Guo, 2020).

2.4 PIRLS data collection instruments – achievement booklets and background questionnaires

Different assessment instruments were used in the PIRLS Literacy 2016 Study. The assessment instruments were specifically designed to be administered in the language of

learning and teaching (LoLT) (Howie et al, 2017). The assessment instruments used stories on Grade 4-level and informational texts collected from different countries (Herget et al., 2019). South African “learners were tested in the language in which they received instruction from Grades 1 to 3 ¹”(Howie et al, 2017, p. 34). The PIRLS 2016 assessment had 12 passages (Warner-Griffen et al., 2017) of which six were trend passages (Howie et al, 2017). The six “trend passages consisted of four prePIRLS passages and two PIRLS passages” (Howie et al, 2017, p.34). The PIRLS passages create an important link between the PIRLS Literacy and PIRLS studies; this enables “the IEA to align the PIRLS Literacy results” with the international PIRLS scales (Howie et al, 2017, p.34). In the first and main assessment, each of the participating learners receive a booklet that contains two reading passages – one informational passage, and one literary experience passage (Warner-Griffen et al., 2017). “The PIRLS Literacy literary and informational passages were accessible to the less proficient reader because it was broken up into manageable sections” (Howie et al, 2017, p.34). Learners started by reading a short section of text, followed by one or two questions about the section they had just read. They then continued on to the next short section, reading and answering questions, and this enabled them to progress through the whole text in stages (Howie et al, 2017). Learners had 40 minutes to complete each of the passages and the questions that followed; they received a five to ten-minute break between each of the passages (Warner-Griffen et al., 2017). The passages in the PIRLS Literacy study were less complex and shorter than in the PIRLS study (Howie et al, 2017). The passages in the PIRLS Literacy study were in a larger font, and looked and felt more like an informational passage or story aimed at young readers (Howie et al, 2017). Learners were also asked to complete a questionnaire regarding their attitudes, backgrounds, and experience in school; they received 30 minutes to complete the questionnaire (Warner-Griffen et al., 2017).

The main purpose of the PIRLS studies is to provide the participating countries with trends in reading comprehension across different studies, information, and learners’ educational opportunities by collecting information from their school, classroom, and home contexts (Roux et al., 2022). The different questionnaires ask numerous questions to determine to what extent reading comprehension is taught in the different contexts. The PIRLS studies test reading literacy, but background questionnaires are also administered to learners, their parents, the teachers of sampled classes, and school principals. The student, teacher, and school questionnaires include questions about classroom and school libraries. This adds to

¹ By the time the assessment was written, African language learners had transitioned to working in English in Grade 4.

reading comprehension because a variety of different types of material is needed in classroom libraries to promote the learners' reading comprehension development (Howie et al, 2017). Lastly, the learners' home background is also inserted in the questionnaires because a strong reading literacy foundation is important as well as the support from parents or caretakers to enable learners to achieve high levels of reading comprehension (Howie et al, 2017).

Different questionnaires were used in the PIRLS Literacy 2016 Study. "The questionnaires were designed to collect information related to the learners reading behaviour and attitudes of the learners, parents, teachers, and school principals towards education and reading in general" (Howie et al, 2017, p.35). The learner questionnaires include questions about reading habits and attitudes to reading, to collect information about the learners' experiences, and their school and home environment were included (Howie et al, 2017). In the parent questionnaire, primary caregivers or parents were asked what their attitude to reading is, their demographics, "the early home activities they conducted with their child, and the quality of the relationship between the school and the parent" (Howie et al, 2017, p.35). Furthermore, in the school and teacher questionnaires, questions were asked about the classroom and school environments, the attitudes of the teachers and principal, and other related factors that include the qualification, teacher professional development, job satisfaction, and years of experience of the teacher(s) (Howie et al, 2017). The participating countries also had the opportunity to add any additional National Options to any or all four questionnaires (Howie et al, 2017). Lastly, the National Options can be described as additional contextual items that can be added to any relevant section or sections of the questionnaires. The National Options allowed for more insights into the social and educational landscape of South Africa (Howie et al, 2017).

Learners of different contexts were tested in the PIRLS Literacy 2016 Study. The home background or home questionnaire was completed by the parents or guardians. The questionnaire consists of questions about the learners' preparation for primary school, which includes preschool attendance and literacy-centred activities in their homes before the learner started school (Mullis & Martin, 2015). Half of the houses had fewer than 10 books available (Howie et al, 2017). Only a few of the learners have "been exposed to early reading literacy activities within their families" (Howie et al, 2017, p.11). "The parents' levels of education were measured through the number of books available in the home and the cultural communication with children" (Howie et al, 2017, p.11). Furthermore, the parents' levels of education were strongly correlated with reading achievement (Howie et al, 2017). The guardians or parents demonstrated relatively low levels of involvement in their

participation in their children's education and schools (Howie et al, 2017). The above was taken into context with the number of children who lived with other family members or guardians or child-headed households (Howie et al, 2017).

The teacher questionnaire was completed by the participating teachers of each classroom in the study. The questionnaire consisted of questions regarding the teacher's own education, their professional development as well as their teaching experience (Mullis & Martin, 2015). Teachers were also asked about the instructional activities and strategies that they implement and use as well as the time spent on reading in their classroom (Mullis & Martin, 2015). Howie et al. (2017) report insufficient time is spent on formal reading instruction or different reading activities in most schools. The same authors state that "top-performing schools and more frequent reading instruction is related to the higher achievement of South African learners" (Howie et al, 2017, p.11). The teachers in South Africa read less often in their spare time compared to countries that performed higher in PIRLS 2006 (Howie et al, 2017). Compared internationally, South Africa introduces the teaching of more complex reading skills at a much later stage than the rest of the world (Howie et al, 2017). The provision of learning materials and textbooks is a problem in South Africa (Howie et al, 2017). "Only half of the schools in South Africa have adequate resources in terms of instructional materials" (Howie et al, 2017, p.11). Lastly, more "investigation is needed in terms of the quality and type of textbooks used in classrooms and their availability in the different African languages" (Howie et al, 2017, p.11).

The principal of each school was responsible for the completion of the school questionnaire. Questions include information regarding the demographic characteristics of the student body, the availability of different instructional resources, and the school learning environment (Mullis & Martin, 2015). Half of the learners of 75% of principals tested in the PIRLS Literacy 2016 Study were reported to be from economically disadvantaged homes (Howie et al, 2017). Furthermore, about 10% of the learners in nearly two thirds of the schools tested spoke a different language from the language that was tested (Howie et al, 2017). One out of five learners attended a school with insufficient resources, which hampered teaching and learning (Howie et al, 2017). More than half of the primary schools in South Africa did not have classroom libraries and the same percentage did not have school libraries (Howie et al, 2017). "Two-thirds of parents felt that the school environment was safe" for their children, but this did not correlate with the perceptions of the learners or principles (Howie et al, 2017, p.11). The learners did not feel safe in general (Howie et al, 2017). "About one out of four Grade 5 learners felt very safe at their school and only one third of the principals felt that their school was very safe" (Howie et al, 2017, p.11). Lastly,

“two thirds of the teachers were satisfied with their career in teaching, but this feeling of satisfaction did not concur with higher achievement” (Howie et al, 2017, p.11).

2.5 PIRLS Literacy 2016 design: Survey research

In 2015 and 2016, fifty countries with “11 benchmark² participants comprising 340 000 learners from 12 000 schools” participated in the PIRLS 2016 study (Howie et al, 2017, p.167). Internationally, this study was one of the most influential, most complex, and largest reading literacy assessments (Howie et al, 2017). South Africa’s participation in the PIRLS 2006 and PIRLS 2011 studies indicated a very low level of achievement by learners in reading literacy (Howie et al, 2017). The 2006 PIRLS study showed low achievement results, which “led directly to a change in the national design for PIRLS 2011 and also affected the design for 2016” (Howie et al, 2017, p.167).

“PrePIRLS was established in 2011 specifically for the countries where the reading comprehension was in a developmental phase” (Howie et al., 2017, p.81). PrePIRLS was the easier version of PIRLS. According to Mihai and Van Staden (2019), the prePIRLS results in South Africa also pointed out continued underachievement by learners with little evidence of improved reading literacy. In terms of the results of the previous grade 4 PIRLS studies, a decision was made to assess the learners again with a more accessible assessment (Howie et al, 2017). This assessment was called PIRLS Literacy, and the international study centre had designed this assessment with the assistance of the national centres (Howie et al, 2017). This study was designed as a shorter, easier test constructed with more of the lower cognitive level items targeted to the less proficient reader (Howie et al, 2017). PIRLS Literacy has similar characteristics to prePIRLS, represents a “new baseline measure for South African Grade 4, and was tested in all 11 languages” (Howie et al, 2017, p.168). However, in 2011, “the African language groups were not assessed at Grade 5 level” because of significantly low performance levels in “PIRLS 2006, and the difficulty of accurately measuring trends in the nine languages” (Howie et al, 2017, p.168). Nevertheless, the 2016 PIRLS study included isiZulu, the largest language group, to ascertain whether there had been any developments in one of the largest African languages over the years and to inform future decisions regarding the design of assessments in these languages (Howie et al, 2017). Hence, with PIRLS 2016, trend data of ten years became

² These are not entire countries, but provinces, states, or sub-samples of a specific population instead of the entire participating country.

available for Grade 4 learners who had been tested in English and Afrikaans, and for Grade 5 learners who had undergone testing in Afrikaans, English, and isiZulu (Howie et al, 2017).

2.6 PIRLS Literacy 2016 sample

The sample for the PIRLS Literacy 2016 Study only included learners with a mean age of at least 9.5 years at the time of testing, and who was enrolled in the grade that represented the fourth year of formal schooling (Warner-Griffin, 2017). This meant that all learners enrolled in the fourth grade, regardless of their age, belonged to the desired international target population (Warner-Griffin, 2017). A two-stage systematic sample was used to select a representative sample of Grade 4 learners, with sampling probabilities proportional to the school's estimated number of fourth-grade learners according to grade enrolments (Warner-Griffin, 2017). Firstly, a school was randomly selected and then a class in that school was randomly selected (LaRoche et al., 2017). The classroom as a whole was sampled, rather than individuals in different classrooms, because PIRLS paid specific attention to learners' curricular and instructional experiences, and these are typically organised on a classroom basis (LaRoche et al., 2017). The PIRLS guidelines stated that a minimum of 150 schools must be sampled with a minimum of 4000 learners to assess (Warner-Griffin, 2017). The classrooms that participated in the sample schools were selected by means of sampling software, WinW3S (Johansone, 2017), provided by TIMSS & PIRLS International Study Centre (Warner-Griffin, 2017). A total of 349 schools with 18 092 learners in Grade 4 (12 810 learners) and Grade 5 (5 282 learners) participated in the PIRLS 2016 South African study (Howie et al, 2017).

2.7 Validity and reliability

PIRLS has high standards for participation rates, sampling precision, as well as sample implementation, to ensure the achievement of national samples of survey estimates and high quality that is unbiased, accurate, and internationally comparable (LaRoche et al., 2017). To ensure the reliability of the texts for the PIRLS assessment, it is reviewed "by educators and curriculum specialists from the countries participating in the assessments" (Mullis & Martin, 2019, p.19). Furthermore, to attain authenticity in the context of an international study, care is taken to ensure that texts can be translated into numerous languages without the loss of clarity and meaning (Mullis & Martin, 2019). The PIRLS and TIMSS International Study Centre have over the years developed a rigorous translation verification procedure to ensure that the translation of each PIRLS text is equivalent or

comparable to the original text (Roux et al., 2022). The quality assurance processes outcomes show that the processes involved in conducting the study and obtaining the data of the study are both reliable and valid (Howie et al, 2017).

2.8 Summary

This chapter discussed the different aspects of PIRLS Literacy 2016. A description of the history of the IEA was given, followed by the different PIRLS studies throughout the years. For this study, the PIRLS assessment framework was discussed with a focus on the contexts for learning and processes of comprehension. The chapter then outlined the PIRLS Literacy 2016 data collection instruments with reference to the achievement booklets and background questionnaires. The rest of the chapter comprised the PIRLS Literacy 2016 design, the PIRLS Literacy 2016 sample, and the validity and reliability of the study. The methodology of the current study is presented in Chapter 4.

Chapter 3 - Literature review

3.1 Introduction

Reading instruction for learners who struggle to read is a topic that has been discussed from many perspectives (Cekiso, 2017). Chang et al. (2017) illustrates Cekiso's (2017) point by asserting that, to help children become proficient readers, effective early reading instruction is critical. Younger learners typically receive instruction in phonics and phonemic awareness³, which provides them with the skills required to decode and read fluently. As learners advance, their literacy instruction requires more time when working on vocabulary and comprehension (Schmidt, 2017). The importance of reading instruction at the elementary level should not be underestimated (Chang et al., 2017). Reading instruction is discussed at length in this chapter.

The last three decades of South African history have seen systemic assessment improve reading achievement while also informing reading instruction practices. South Africa became a democracy in 1994, and since then “the South African government has made various attempts to improve literacy levels in the country” (Bharuthram, 2012). In 1995, South Africa began to participate in the Trends in International Mathematics and Science Study (TIMSS) (Reddy et al., 2022). The primary goal of the TIMSS is to assist countries in the evaluation and monitoring of their mathematics and science teaching and learning, as well as their achievement outcomes across different grades and overtime periods (Reddy et al., 2022). The Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) was founded in 1995, and South Africa joined their first SACMEQ II study in 2000 (Makgamatha, 2022). The primary purpose of SACMEQ is to expand opportunities for educational planners to gain the technical skills that are required to evaluate and monitor the general conditions of schooling as well as the quality of basic education in their respective systems (DBE, 2017). In the years 2001 and 2004, the South African Department of Education conducted two national systemic evaluations to assess primary school literacy and numeracy levels (DBE, 2008). In 2006, South Africa began participating in the Progress in International Reading Literacy Study (PIRLS). Since then, South Africa participated in the 2011 and 2016 studies (Howie et al., 2017). The National Reading Strategy was implemented in 2008. The Department of Basic Education introduced the Annual National Assessments (ANA) in 2011. These assessments offered the possibility

³ Phonemic awareness can be referred to as the conscious awareness of the individual phonemes in spoken words (Brady, 2020).

of assessing learners' performance across the different grades that were tested (Van der Berg, 2015). The ANA assessments were standardised national assessments designed specifically for language and mathematics in Grades 1 to 9 (DBE, 2022). The Department of Basic Education supplied question papers and memoranda to selected schools who, in turn, were responsible for conducting and marking the tests as well as moderating them internally (DBE, 2022). South Africa has participated in a considerable number of large-scale studies to promote better schooling.

The National Curriculum and Assessment Statement (CAPS) provides educators with a guideline to teach reading in Grades 4 to 6 Afrikaans and English Home Language. The home language options prescribe that 2.5 hours per week should be used to teach reading (DBE, 2012). It also provides for language skills that reflect basic interpersonal communication and cognitive academic skills (DBE, 2012). According to the Department of Basic Education (2012), emphasis is placed on teaching learners listening, speaking, reading, and writing skills. In addition, this level promotes the learners' literacy, as well as aesthetic and imaginative competencies, which, in turn, endows them with the abilities to recreate, better understand, and use their imagination in their worlds (DBE, 2012). "In the intermediate and senior phases, learners strengthen their skills in listening, speaking, reading, and writing" (DBE, 2012, p.9). These four skills all resort under the category for thinking and reasoning.

In the South African context, well-developed reading skills are emphasised throughout the curriculum (DBE, 2012). A learner is required to master well-developed reading skills for successful learning, as well as full participation in the community and work setting (DBE, 2012). According to the Department of Basic Education (2012), learners develop reading skills and search for information in a wide range of literary, non-literary, and visual texts. Furthermore, learners should be able to recognise the importance of genre and realise how different genres portray the goal of reading (DBE, 2012). Learners must become "critical and creative thinkers through class and independent reading" (DBE, 2012, p.10). Lastly, the teachers should set up a variety of reading comprehension activities to ensure that learners understand the material they have been engaging with (DBE, 2012).

The aim of Chapter 3 is to present an overview of the literature in this study. The Progress in International Reading Literacy Study (PIRLS) measures the learner reading literacy achievement of young learners in their fourth year of schooling (Mullis et al., 2017) and, as already mentioned, consists of adjusted assessments better suited to our learners' abilities (Howie et al., 2017). Howie et al. (2017) write that "reading literacy is at the heart of the

learning crisis”. Different factors have an impact on reading literacy. The PIRLS Literacy 2016 Study listed nine reading instruction strategies in the teacher’s questionnaire to determine what reading skills and strategies Grade 4 teachers emphasised during weekly reading instruction sessions (Howie et al., 2017). Lastly, the 2016 PIRLS Literacy data for South Africa can be used to determine to what extent different factors – in the classroom or at home – influence learners’ reading literacy achievement. The socio-economic statuses of the learners are also taken into consideration.

Section 3.2 of this study elaborates on reading instruction and reading literacy achievement, while section 3.3 provides details on specific aspects of reading comprehension that develop as a result of reading instruction. Section 3.4 focuses on the socio-economic status of the learners who participated in the South African PIRLS Literacy 2016 Study. Finally, section 3.5 introduces the conceptual framework of the study to the discussion.

3.2 Reading Instruction, Reading Literacy Achievement, and Reading Comprehension

3.2.1 Reading instruction

According to Chang et al. (2017), there is a debate on whether the focus of reading instruction should be on the relationship between sound and print (phonics) or on the relationship between meaning and print (as in sight-word reading). The relationship between sound and print is typically characterised by phonics-style training where the phonemes associated with individual letters and then with groups of letters is trained intensively, which enables learners to decode on a letter-by-letter basis (Chang et al., 2017). The relationship between meaning and print (as in sight-word reading) is often referred to as ‘whole-word’ or ‘meaning-focused’ language instruction, where the pronunciation and meaning of the whole word are provided to the learner during teaching (Chang et al., 2017). The phonics-style method and whole-word method offer illustrations of different reading instruction strategies that can be used to teach learners how to read.

3.2.1.1 Reading instruction strategies

Ngure (2019) states that reading strategies are one of the essentials tools for enabling learners to acquire reading skills. Skilled readers use several strategies at the same time, and strategies are not used in isolation (Klapwijk, 2015). Klapwijk (2015) writes that reading strategies can be defined as the action skills readers use to assess whether they understand

what they have read. Reading instruction strategies include the teaching of reading using different strategies through explaining, modelling, and learner practicing (Zhao et al., 2016). Reading instruction strategies entails the use of strategies to enable learners to conduct reading comprehension tasks with the aim of enabling them to comprehend different texts.

There are different reading strategies in the English Home Language CAPS document for Grades 4 to 6. Reading strategies should always be in favour of learners' reading achievement (Deregözü & Üstün, 2021). The CAPS document for English Home Language Grade 4 to 6 prescribes the following strategies for teaching reading, skimming, and searching for main ideas (DBE, 2012, p.17):

- attentive reading for supporting details, which allows learners to derive the meaning of unfamiliar words and images through the use of word processing skills and contextual cues;
- rereading;
- making notes about main and supporting ideas;
- point-by-point summaries of main and supporting ideas according to the desired length as indicated;
- explanation;
- the drawing of conclusions;
- explanations of the author's perspective or point of view, and the student's ability to draw his or her own conclusions or form an individual opinion.

Rereading refers to the process of rereading a text to help improve the learner's comprehension of the text (Par, 2020). Öztürk (2018) explains restating as paraphrasing or writing ideas in your own words. Furthermore, what is critical to these instruction strategies is the way in which teachers can apply them when doing reading instruction in the early grades. Of course, the CAPS Grade 4 to 6 English Home Language curriculum has drawn its fair share of criticism. According to De Lange et al. (2020) minimal attention is given to the teaching of comprehension or its assessment in the Grade 4 to 6 English Home Language CAPS document. Lastly, only two reading strategies are mentioned in the Grade 4 to 6 English Home Language CAPS document, and neither is mentioned in the text itself; it only appears in the glossary (De Lange et al., 2020).

De Lange et al. (2020) conducted a study to determine South African teachers' understanding and use of reading strategies in their classrooms. It was discovered that the teachers in the study only used a small number of reading strategies in their classrooms

(De Lange et al., 2020). It was also clear that very few of the teachers in the study understood and implemented different reading strategies (De Lange et al., 2020). Cekiso (2017) did a study on teachers' perceptions of reading instruction in selected primary schools in the Eastern Cape Province. In this study, Cekiso (2017) found that Foundation Phase teachers focused on oral readings to the detriment of other skills, particularly whole-class reading, group reading, and pair reading. In their research on the difficulties of teaching Grade 3 learners with reading problems in full-service schools in South Africa, Phala and Hugo (2022) discovered that teachers have insufficient knowledge of different reading strategies and this limits their ability to remedy reading challenges in schools. Spaul and Pretorius (2019) state that, by the end of a learner's third year of schooling, learners around the world should be able to read fluently and with understanding in at least one language of choice. The teaching of reading literacy must be the "core business" of any primary school (Spaul & Pretorius, 2019). These studies have proven that teachers do not have adequate knowledge of the different reading strategies that can be used to teach reading.

3.2.1.2 PIRLS Framework for learner reading literacy achievement (2011 & 2016)

It is important to update the PIRLS framework with each assessment cycle. "This provides participating countries with the opportunity to introduce new ideas and exchange current information about curricula, standards, frameworks, and instruction" (Mullis, 2013, p.6). This ensures that the framework is educationally relevant, creates coherence from assessment to assessment, and permits the instruments, framework, and procedures to gradually evolve (Mullis, 2013). According to Mullis (2013), the framework for the PIRLS 2016 study was updated by using the information provided by the PIRLS 2011 Encyclopaedia and the national research coordinators from all the participating countries. "Based on the reading purposes and comprehension process, the PIRLS framework provides the foundation for the PIRLS and prePIRLS assessments of student reading achievement" (Mullis, 2013, p.6).

The PIRLS framework focuses on the two overarching purposes for reading that account for most of the reading young learners do inside and outside of school: the acquisition and utilisation of information (Mullis et al, 2013).

As already mentioned, the PIRLS assessment integrates the four broad-based comprehension processes. Although the four comprehension processes form the basis for assessing PIRLS as well as prePIRLS and e-PIRLS (e-PIRLS is the computer-based

assessment), there are some differences in emphases across the assessments. The following table is a presentation of the reading purposes and processes assessed by PIRLS and the percentages of the test devoted to each for PIRLS, pre-PIRLS, and e-PIRLS (Mullis et al., 2013, p.16).

	“PIRLS	Pre-PIRLS	e-PIRLS
Purpose for reading			
Literary Experience	50%	50%	0%
Acquire and Use Information	50%	50%	100%
Processes of Comprehension			
Focus on and Retrieve Explicitly Stated Information	20%	50%	20%
Make Straightforward Inferences	30%	25%	30%
Interpret and Integrate Ideas and Information	30%	25%	30%
Evaluate and Critique Content and Textual Elements	20%		20%

Figure 1: Percentages of the PIRLS, pre-PIRLS, and e-PIRLS Reading Assessments Devoted to Each Reading Purpose and Comprehension Process (Mullis et al., 2013:16)

PIRLS collects extensive information about school and home contexts (Hooper et al., 2013). Furthermore, the students, parents, principals, and teachers in the participating countries complete questionnaires to provide important information about students’ home and school contexts pertaining to the teaching and learning of reading (Hooper et al., 2013). Each of the questionnaires covers a wide range of policy-relevant information about the country’s various contexts for learning and teaching reading (Hooper et al., 2013). “Students in their fourth year of schooling have gained most of their reading skills both at home and at school” (Hooper et al., 2013, p.33). Hooper et al. (2013, p.33) explain that “the PIRLS 2016 Context Questionnaire Framework encompasses five broad areas, namely, national and community contexts, home contexts, school contexts, classroom contexts, and student characteristics and attitudes to learning.”

3.2.1.3 Reading comprehension in the process of evaluation in PIRLS Literacy 2016

The PIRLS Literacy 2016 Study assesses learners' ability to undertake several reading comprehension processes (Howie et al., 2017). Four comprehension processes were assessed in PIRLS Literacy 2016: to "*focus on and retrieve explicitly stated information, make straightforward inferences, interpret and integrate ideas and information, and examine and evaluate the content, language, and textual elements*" (Howie et al., 2017, p.6). Considered against the backdrop of Bloom's taxonomy, these processes can be divided into lower-order and higher-order cognitive levels. The focus on and retrieval of explicitly stated information correspond with cognitive levels one and two, while making straightforward inferences, interpreting and integrating ideas and information, and examining and evaluating the content, language, and textual elements are on cognitive levels three, four, and five (Howie et al., 2017). The processes of comprehension in terms of reading comprehension are discussed in the following paragraph.

Focusing on and retrieving explicitly stated information require learners to locate the content and understand the parts that are relevant to the question (Howie et al., 2017). The items that test this process require the learner to focus on the sentence, phrase, and word level for the main purpose of constructing meaning (Howie et al., 2017). The process of making straightforward inferences allow learners to resolve gaps in meaning and move beyond the surface of texts (Howie et al., 2017). "Some of these inferences are straightforward because they are based primarily on information that is found in the text and require learners to connect one or more ideas" (Howie et al., 2017, p.24). In the process of interpreting and integrating ideas and information, the learners may focus on local and global meanings (Howie et al., 2017). When learners interpret and integrate, they construct meaning by associating personal experience and knowledge with the meaning that resides in the text (Howie et al., 2017).

The processes of examining and evaluating content, language, and textual elements is brought to a specific text. This could potentially enable learners to shift their focus to constructing meaning in order to better understand the text critically (Howie et al., 2017). When taking the processes of comprehension into consideration, teachers must consider the implications it has for teaching CAPS in their classrooms.

3.2.1.4 The nine reading instructional strategies tested in the PIRLS Literacy 2016 Study

In the PIRLS Literacy 2016 Study, nine reading instruction strategies were selected to understand the strategies most often used in the classroom during reading instruction. These strategies are universal across countries and should feature across all curricula in one form or another. In the school questionnaire (2015, p. 7), principles of each participating school were asked the following question: “At which grade do the following reading skills and strategies first receive a major emphasis in instruction in your school?:

- 1) Knowing letters of the alphabet; 2) Knowing letter-sound relationships; 3) Reading words; 4) Reading isolated sentences; 5) Reading connected text; 6) Locating information within the text; 7) Identifying the main idea of a text; 8) Explaining or supporting understanding of a text; 9) Comparing a text with personal experience; 10) Comparing different texts; 11) Making predictions about what will happen next in a text; 12) Making generalizations and drawing inferences based on a text; 13) Describing the style or structure of a text; 14) Determining the author’s perspective or intention”.

The following question was asked in the PIRLS Literacy 2016 teachers’ questionnaire (2015, p. 8) about the nine reading instruction strategies: “How often do you ask the students to do the following things to help develop reading comprehension skills or strategies?:

- 1) Locate information within the text; 2) Identify the main ideas of what they have read; 3) Explain or support their understanding of what they have read; 4) Compare what they have read with experiences they have had; 5) Compare what they have read with other things they have read; 6) Make predictions about what will happen next in the text; 7) Make generalisations and draw inferences; 8) Describe the style or structure of the text; and 9) Determine the author’s perspective or intention”.

The PIRLS Literacy study allocates a benchmark description for teachers to each of these strategies to determine how well learners read different types of texts. The PIRLS International Benchmarks aim to offer descriptions of what learners ought to be able to do at each benchmark set for reading comprehension skills (Howie et al., 2017). The four benchmark descriptions are “low international benchmark, intermediate international benchmark, high international benchmark and advanced international benchmark” (Howie et al., 2017, p.70). Each of these benchmarks consists of two categories, distinguishing between what learners should be able to do when reading literary texts and when reading informational texts (Howie et al., 2017). The following table is a summary of each reading

instructional strategy with its corresponding benchmark description (Howie et al., 2017, p.70).

“Benchmark Description	Categories	
	When reading literary texts, learners can:	When reading informational texts, learners can:
Low international benchmark (400 - 474 points)	<ul style="list-style-type: none"> - Locate and retrieve explicitly stated information 	<ul style="list-style-type: none"> - Locate and retrieve 2-3 pieces of information in the text - Find information in text boxes, headings, and figures
Intermediate international benchmark (475 - 549 points)	<ul style="list-style-type: none"> - Retrieve and reproduce explicit information - Make straightforward inferences about character feelings, motivations - Interpret obvious reasons and causes, give basic explanations 	<ul style="list-style-type: none"> - Locate and reproduce 2-3 pieces of information from the text - Use subheadings, figures & text boxes to locate information - Retrieve & reproduce explicit information
High international benchmark (550 - 625 points)	<ul style="list-style-type: none"> - Identify significant events and actions - Make inferences and explain relationships, give text-based support - Identify the significance of events, recognise language features (tone) 	<ul style="list-style-type: none"> - Locate relevant information within complex text or table - Make inferences and logical connections to provide explanations - Evaluate content and make generalisations
Advanced international benchmark	<ul style="list-style-type: none"> - Integrate ideas and evidence across a text 	<ul style="list-style-type: none"> - Distinguish and interpret complex information from

(625 points and above)	to appreciate overall themes - Interpret story events & character actions, provide text-based insights	different parts of the text - Integrate information across a text to provide explanations, interpret significance, and sequence activities
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Table 1: The international Benchmark of PIRLS Literacy Reading Achievement (Howie et al., 2017, p.70)

The PIRLS reading instruction strategies can be operationalised in terms of the benchmarks. The following table shows how these strategies are operationalised in terms of the benchmarks.

Low international benchmark		
Benchmark score	When reading relatively complex literary texts, students can:	When reading relatively complex informational texts, students can:
400	<ul style="list-style-type: none"> • Locate and retrieve explicitly stated information, actions, or ideas • Make straightforward inferences about events and reasons for actions • Begin to interpret story events and central ideas 	<ul style="list-style-type: none"> • Locate and reproduce explicitly stated information from text and other formats (e.g., charts, diagrams) • Begin to make straightforward inferences about explanations, actions, and descriptions
Intermediate international benchmark		
	When reading a mix of simpler and relatively complex literary texts, students can:	When reading a mix of simpler and relatively complex informational texts, students can:
475	<ul style="list-style-type: none"> • Independently locate, recognise, and reproduce explicitly stated actions, events, and feelings 	<ul style="list-style-type: none"> • Locate and reproduce two or three pieces of information from text

	<ul style="list-style-type: none"> • Make straightforward inferences about the attributes, feelings, and motivations of main characters • Interpret obvious reasons and causes, recognise evidence, and give examples • Begin to recognise language choices 	<ul style="list-style-type: none"> • Make straightforward inferences to provide factual explanations • Begin to interpret and integrate information to order events
High international benchmark		
	When reading relatively complex literary texts, students can:	When reading relatively complex informational texts, students can:
550	<ul style="list-style-type: none"> • Locate and distinguish significant actions and details embedded across the text • Make inferences to explain relationships between intentions, actions, events, and feelings, and give text-based support • Interpret and integrate story events and character actions, traits, and feelings as they develop across the text • Recognise the use of some language features (e.g., metaphor, tone, imagery) 	<ul style="list-style-type: none"> • Locate and distinguish relevant information within a dense text or a complex table • Make inferences about logical connections to provide explanations and reasons • Integrate textual and visual information to interpret the relationship between ideas • Evaluate and make generalisations about content and textual elements

Advanced international benchmark		
	When reading relatively complex literary texts, students can:	When reading relatively complex informational texts, students can:
625	<ul style="list-style-type: none"> • Interpret story events and character actions to describe reasons, motivations, feelings, and character development with full text-based support • Begin to evaluate the effect on the reader of the author's language and style choices 	<ul style="list-style-type: none"> • Distinguish and interpret complex information from different parts of text, and provide full text-based support • Integrate information across a text to explain relationships and sequence activities • Begin to evaluate visual and textual elements to consider the author's point of view"

Table 2: Description of the PIRLS 2016 International Benchmarks (Mullis et al., 2017)

“Only 0.2% of South African learners achieved the advanced benchmark, and 78% of learners did not reach the low benchmark in 2016” (Howie et al., 2016, p.73). At the end of Grade 4, these learners were unable to locate explicit information or reproduce information from a text (Howie et al., 2017). Internationally, only 4% of learners did not reach the lower benchmark and 10% of learners reached the advanced benchmark (Howie et al., 2017). South African learners who wrote their tests in Afrikaans or English were more likely to reach the high benchmark. By contrast, more than 80% of the learners who wrote their tests in an African language were unable to attain even the lowest of the international benchmarks (Howie et al., 2017). Howie et al. (2017) state that South Africa faces many educational challenges, which raises concerns about how teachers teach reading literacy in schools. The benchmarking figures of our South African Grade 4 learners point to a lack of basic reading literacy skills (Howie et al., 2017).

3.2.1.5 The relationship between reading instruction strategies and reading literacy achievement

Reading instruction strategies play an important role in reading literacy achievement. Nine reading instruction strategies were emphasised in teacher questionnaires. These strategies can be placed into the four broad-based cognitive processes of comprehension discussed in Chapter 2 (Howie et al., 2017). The South African Grade 4 learners achieved higher scores (321 points) in the questions aimed at lower-order cognitive processes and achieved significantly lower scores (308 points) in the higher-order cognitive processes (Howie et al., 2017). Interpretation, integration, and evaluation are all crucial reading comprehension skills that learners require throughout their schooling careers (Howie et al., 2017).

3.2.2 Reading Literacy Achievement

Early reading literacy is one of the most important aspects of a learner's early school years (Brink & Nel, 2019). Isci (2021) regards reading literacy as one of the most crucial aspects of academic success in all occupational fields. Reading literacy involves different abilities to construct meaning from a variety of different texts and the behaviour and attitudes that turn individuals into lifelong readers (Mullis, 2013). The "development of reading literacy is influenced by home, classroom, school, and broad societal factors" (Howie et al., 2017, p.30). Furthermore, reading literacy achievement is used as a general term to describe the level of reading comprehension of the school population (Araujo, 2014). Van Staden and Bosker (2014) state that the instruction of reading comprehension skills and strategies can be identified as a significant predictor of reading literacy achievement.

3.2.3 Reading comprehension

According to Hjetland et al. (2019), the main goal of reading is to comprehend a given text. Reading comprehension is defined by Muliawati (2017) as a step-by-step process that includes letter-by-letter recital and pronunciation and then combining the letters to form words that have a particular meaning. Furthermore, reading comprehension plays an important role in learners' education. Reading comprehension is not just crucial for understanding text, but also for success in education and in social activities (Oakhill et al., 2019). Reading comprehension is critical for participation in society and all aspects of education (Hjetland et al., 2020). Hjetland et al. (2020) and Smith et al. (2021) concur that reading comprehension is essential to academic progress because it underpins the content

areas of learning in different subjects. The following paragraph discusses inferential and evaluative reading comprehension.

Inferential and evaluative reading comprehension is implemented in a curriculum in order to promote a learner's use of both lower and higher-order thinking skills. Inferential reading comprehension can be referred to as an implicit reference to anything that does not explicitly appear in the text (Guevara et al., 2020). In inferential comprehension, the learner plays an active role in constructing the meaning that is stated in each text. Inferential comprehension also involves the ability to draw conclusions (Dewi et al., 2020). Inferential reading is the ability to realise the hidden concepts and unstated relationships between the lines of each text (Samiei & Ebadi, 2021). To understand a text inferentially is to know what the information in the text implies (Dewi et al., 2020). Evaluative reading comprehension is referred to as the highest level of reading comprehension, as it is built upon a learner's ability to make judgments of the text (Medina & Nagamine, 2019). The CAPS document for Grade 4 to 6 Home Language emphasises "both lower and higher-order cognitive levels of reading comprehension" (Howie et al., 2017, p.22). There are five cognitive levels of reading comprehension: literal, reorganisation, inference, evaluation, and appreciation (Howie et al., 2017). The following paragraph discusses evaluation as a process of reading comprehension in PIRLS Literacy 2016.

3.2.3.1 The impact of reading instruction strategies on the achievement of reading comprehension

The ability to read can be seen as a complex process, as it also entails understanding and interpreting the content of what is read (Ardhian et al., 2020). Love et al. (2021) and Ardhian et al. (2020) state that the ability to read and understand a text is seen as one of the basic conditions to succeed in life. Therefore, a learner must use different reading strategies to ensure that they do not waste time repeatedly reading a text without getting the necessary answers (Muhid et al., 2020). Marzuki et al. (2018) discovered that the implementation of cognitive reading strategies improves reading comprehension. A study conducted by Thresia (2017) yielded strong evidence that reading strategies correlate with reading comprehension achievement. Howie et al. (2017, p.20) state that "the use of reading strategies aids higher-order reading comprehension." Lastly, reading comprehension can be seen as a reading activity to understand the different contents that can be read (Ardhian et al., 2020).

3.3 Socio-economic status

Socio-economic status (SES) can be defined as the measurement of the social and economic status of family members (Chen et al., 2018). Finegan et al. (2018) supplement this by adding that SES refers to the individual's level of prestige or resources in relation to others; an individual's SES can be measured via income, social hierarchy, level of education, or occupation. According to Howie et al. (2017, p.166), "the home environment tends to be an important factor in a learner's reading literacy achievement." A study by Dolean et al. (2019) provided evidence to show that SES does play an important role in the development of reading skills among learners. SES is included in this study because of the impact it has on learners' school performance, which is directly dependent on reading literacy.

The PIRLS Literacy 2016 Study consisted of four questionnaires that were given to learners and different role players. The following paragraph discusses the school questionnaire and the location of each school that participated in the PIRLS Literacy 2016 Study, as location is a direct clue to a learner's socio-economic status. "The questionnaire, completed by school principals, sought information about the school location and school composition in terms of socio-economic background" (Howie et al., 2017, p.91).

3.3.1 School socio-economic status in the current study

Socio-economic status is an important predictor of achievement worldwide. A school's environment can influence the effectivity and ease with which curricular goals are reached (Hooper et al., 2013). The PIRLS Literacy 2016 Study focused on "a set of well-researched school quality indicators, with school composition by student socioeconomic background" being one of the indicators (Hooper et al., 2013, p.42). According to Mullis et al. (2017), 38% of learners who participated in PIRLS 2016 attended schools with more affluent than disadvantaged learners, while 33% of learners who participated in PIRLS 2016 attended schools with a balance of affluent and disadvantaged learners (Mullis et al., 2017). Twenty-nine percent of learners attended schools with a learner population consisting of more disadvantaged than affluent learners (Mullis et al., 2017). The PIRLS 2016 study clearly showed that learners who attended more affluent schools generally scored higher in reading achievement (Mullis et al., 2017).

School locations are divided into six categories, which are "urban (densely populated), suburban (on fringe or outskirts of urban area), a township near an urban area, medium-

sized city, or large small town or village, and remote rural” (Howie et al., 2017, p.92). The school principals reported that of the participating Grade 4 learners 39% attended schools in remote rural areas compared to other areas (Howie et al., 2017). Furthermore, learners attending schools in remote rural areas performed considerably poorer than their peers from other areas (Howie et al., 2017). In addition, learners in urban areas achieved 384-417 points, while learners in remote rural areas only achieved 291 points (Howie et al., 2017). Lastly, Howie et al. (2017, p.92) found that learners achieved “20 points higher in townships than learners in remote areas, and more than 100 points below the highest-performing group.”

The following paragraph explains the quintile system that was used in the PIRLS Literacy 2016 Study. According to Howie et al. (2017), school funding in the South African context is allocated according to a poverty index, which is known as the quintile system. Maistry and Africa (2020) add that schools receive a grading or ranking between one and five, and schools in the lowest quintiles receive a bigger government subsidy per learner. Quintile one, two, and three schools are the poorest; as non-fee-paying schools, they receive more funding from government (Howie et al., 2017). Quintile four and five schools are located in more affluent areas, receive less funding, and are fee-paying schools (Howie et al., 2017). The sample of schools that participated in the PIRLS Literacy 2016 Study was not specifically selected based on quintiles (Howie et al., 2017). The results of the PIRLS Literacy 2016 Study per quintile are discussed in the next paragraph.

In the PIRLS Literacy 2016 Study, the sample was not stratified by quintile, but it was reported because it had equity implications (Howie et al., 2017). Many learners who participated in the PIRLS Literacy 2016 Study were from quintile one, two, and three schools that fit the national schooling population (Howie et al., 2017). A high percentage of learners did not reach the lowest benchmark. It is also important to note that these quintiles also consist mainly of learners who were tested in African languages (Howie et al., 2017). Quintile five was the smallest and highest-performing group (Howie et al., 2017). In addition, these schools attained both low and high benchmarks while the learners were mostly tested in Afrikaans and English, despite the fact that there was considerable variation in the home language of the pupils tested (Howie et al., 2017). Learners in quintile five schools achieved significantly higher results than learners in schools with lower rankings (Howie et al., 2017). They received almost 100 points more than quintile four learners and almost 140 points more than quintile one learners did (Howie et al., 2017). “No significant differences were found between learners in quintiles one, two, and three” (Howie et al., 2017, p.93).

The South African government tried to address inequality and gaps in resources by using the quintile system. In 2007, the No-fee School Policy was implemented and expanded over subsequent years to help include poor schools. The government then funded expenses previously covered by school fees paid by parents or caregivers. In 2019, 87% of schools were no-fee schools compared to 78.9% in 2016 (DBE, 2022). No-fee schools are allocated more state funding per learner in comparison to fee-charging schools (DBE, 2022).

3.3.2 The impact of socio-economic status (SES) on reading literacy achievement

The socio-economic status (SES) of a community influences reading literacy achievement among its learners. According to Howie et al. (2017), the PIRLS Literacy 2016 Study revealed that internet access, educated parents, a professional occupation, and books in the home all contributed substantially to learner reading literacy achievement.

Furthermore, the school environment can have a positive influence on learners' academic success, as it affects the attitudes of pupils and educators about learning and teaching (Howie et al., 2017). The SES at home and at school have different implications for a learner.

School principals completed the PIRLS Literacy School Questionnaire, which collected information on factors such as school composition, and school location – all in terms of the socio-economic background (Howie et al., 2017). The school principals reported that 39% of South African Grade 4 learners attended schools in remote rural areas (Howie et al., 2017). The 2016 PIRLS Literacy data clearly showed that learners who attended schools in remote rural areas only received 291 points – a full 209 points less than the average benchmark of 500 (Howie et al., 2017). A total of 89% of school principals indicated that the shortage of school resources hampered the learning and teaching process (Howie et al., 2017). On average, Grade 4 learners achieved 53 points higher when attending schools with little to no problems than learners who attended schools with moderate to severe problems (Howie et al., 2017). Different factors relating to the school environment seemed to have an impact on the PIRLS Literacy study and could be positively associated with the reading literacy performance of Grade 4 learners (Howie et al., 2017).

As part of the PIRLS Literacy School and Parent Questionnaires, principals were asked questions about the learners with particular reference to their school's socio-economic background (Howie et al., 2017). These questions revealed that 75% of learners came from

disadvantaged backgrounds (Howie et al., 2017), and this cohort of learners scored 119 points less than learners from more affluent communities (Howie et al., 2017). Only 1% of learners in South Africa have more than 101 books and more than 26 children's books at home, compared to 20% of learners internationally (Howie et al., 2017). Learners who have fewer resources (0-25 books and 0-10 children's books) at home received around 200 points less than learners who came from homes with an abundance of resources (Howie et al., 2017). It was found that learners who had their own rooms, educated parents with high-level occupations, internet access, and books in their homes performed better in reading literacy (Howie et al., 2017). The data illustrated that the home environment is an important factor in learners' reading literacy achievement (Howie et al., 2017).

3.4 Conceptual framework

3.4.1 Conceptual Framework for the current study

The conceptual framework used in this study was the PIRLS 2011 framework that had been utilised in the analysis of the 2016 PIRLS Literacy data. The diagram reflects the important impact of national and community context (which can be divided into the home, school, and classroom) has on the instructional experiences of the learner. Controlling socio-economic status in a highly economically differentiated country such as South Africa will give a clearer understanding of how different teaching strategies affect learners within the different national and communal contexts. This study focused on classroom instruction, and inferential and evaluative reading comprehension is affected by teachers' choice of reading strategies within the different socio-economic contexts found within the communities of South Africa. This model seems to provide an appropriate conceptual model to guide this study. Due to time constraints, learners' behaviours and attitudes were not directly examined in this study, but as the diagram indicates, these facets are most likely impacted by teaching and learning activities, which are central to the research focus of this study.

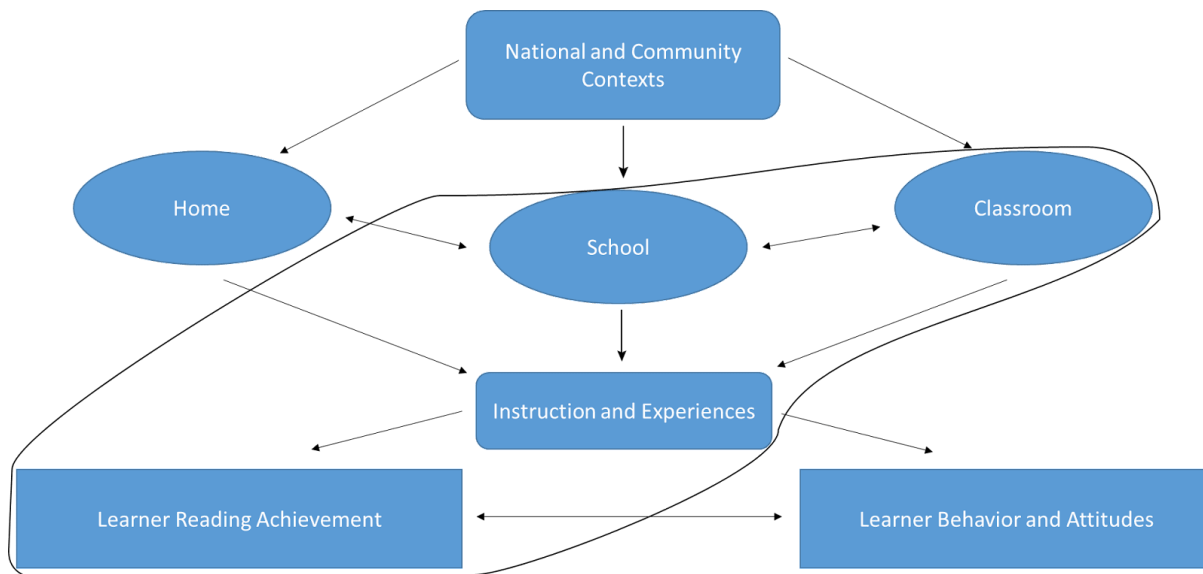


Figure 2. A conceptual framework for PIRLS 2011 (Mullis et al., 2009)

3.4.2 Context as conceptualised for the current study

The conceptual framework consists of different aspects and starts with national and community contexts. Thus, the question was posed of how national and community contexts influence the home, school, and/or classroom. This framework also provides room for the influence that a particular school has on instruction and experiences. Question G8 was used to determine the socio-economic status of the different schools that participated in the study. Questions R1, R5 and R11 wanted to determine the different classrooms situations that participated in the PIRLS Literacy 2016 to better understand the influence this aspect has on the learners' reading literacy achievement. In this research study, the researcher wanted to determine *to what extent teachers' use of specific reading instruction strategies affected learner reading comprehension achievement in the reading comprehension process of evaluation*. Questions R3, R6, R7, R8, R9, and R10 from the Teacher Questionnaire were used to determine the answer to the first question. Furthermore, what is the relationship between instruction and experiences on learner reading achievement? This aspect of the framework helped to understand the relationship between the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study and Grade 4 learner reading literacy achievement (question 2 in the research study) Questions R4, R21 and R22 from the Teacher Questionnaire were used to determine the answer to the second question in the study. Lastly, the variables used in the current research study were reading instruction strategies, reading literacy achievement, reading comprehension achievement, the process of evaluation, and school socio-economic status. All variables could be placed into this framework to analyse the data used in this study.

3.5 Conclusion

Chapter 3 highlighted the different aspects of reading, namely, reading instruction, reading literacy achievement, and reading comprehension. Reading is an important skill that everyone needs to learn and improve over time. Reading instruction strategies as seen in this chapter are important in both the reading literacy achievement and reading comprehension of the learners. Reading strategies promote learners' reading comprehension, which then influences their reading literacy achievement. Furthermore, socio-economic status must also be considered when testing learners' reading literacy achievement. In the South African 2016 PIRLS Literacy 2016 study it was clear that the school environment and climate were "positively associated with the Grade 4 learners' reading literacy performance" (Howie et al., 2017, p.173). This study is conceptualised in terms of the relationship between reading instruction strategies and learner reading literacy achievement when controlling for the socio-economic status of learners. This chapter concluded with a discussion of the PIRLS 2011 conceptual framework (Mullis et al., 2009) as a conceptual base on which to build the current study.

Chapter 4 - Research Methodology

4.1 Introduction

This study aims to determine how teachers' use of specific reading instruction strategies affect learner reading comprehension achievement in terms of making straightforward inferences, and interpreting and integrating ideas and information. The study builds on previous research conducted on the South African data of the PIRLS Literacy 2016 Study. Chapter 4 outlines and explains the research methodology and the methods used in this study. The study aims to understand the outcome as stated in the research questions, how does teachers' use of specific reading instruction strategies affect learner reading comprehension achievement? The main research question for this study is: *What is the relationship between reading instruction strategies and Grade 4 learner reading literacy achievement when controlling for socio-economic status for learners tested in PIRLS Literacy 2016?* The post-positivist paradigm was used in the analysis of the data. The 2016 PIRLS Literacy data is numerical, which allowed the researcher to apply specific statistical techniques to attempt to determine the possible extent to which teachers' use of specific reading instruction strategies affects learner reading comprehension achievement. Lastly, Johnston (2014) states that secondary data analysis reviews previously collected data, and this design also enables the use of quality large datasets such as the PIRLS Literacy 2016 Study.

Section 4.2 describes the current study in terms of epistemology and the research design is discussed in Section 4.3. The sample and data source are discussed in Sections 4.4 and 4.5. Furthermore, the alignment of instruments to research questions, framework and data analysis is discussed in Sections 4.6 and 4.7. The validity, reliability and ethics of the study can be found in Sections 4.8 and 4.9, and 4.10 contains a summary of Chapter 4.

4.2 Epistemological assumptions

Kivunja and Kuyini (2017) state that epistemology in research is used to understand how people come to know something and how people know the truth or understand reality. In this study, the postpositivist paradigm was used to collect and analyse the data and, thus, the assumptions are philosophically grounded. This paradigm helps to show the data as logically coherent and grounded in critical realism. It helped to improve and refine the 2016 PIRLS Literacy data relevant to the study to make different claims, while still being changing

and contingent. The postpositivist paradigm was selected for this study to attempt, through secondary data analyses, to determine the extent teachers' use of specific reading instruction strategies affects learner reading comprehension achievement in the processes of comprehension using the PIRLS Literacy 2016 data.

4.3 Methods and Design: Current study

The PIRLS Literacy 2016 Study was conducted in the form of a survey, but this research study utilised secondary data analysis to draw on a selection of items from the South African data. This selection of data was obtained by means of a cross-sectional survey. Secondary data analysis as research design refers to the use of existing research data to find answers to questions that are different from the existing answers (Tripathy, 2013). In this study, the secondary data was collected to determine the extent of teachers' use of specific reading instruction strategies and how it affects learner reading comprehension achievement on the scales of making straightforward inferences, and interpreting and integrating ideas and information. Lastly, the data in secondary data can be numeric or non-numeric, in this study the data is numeric.

The PIRLS Literacy 2016 Study collected data from teachers and school principals of Grade 4 learners. This study is considered quantitative because it used selected variables from the teacher and school principle questionnaires. In quantitative research, the key is to select only a subgroup to represent a population; in this study, it was the teachers and principals who had participated in the South African 2016 PIRLS Literacy 2016 Study. This enables the researcher to generalise the findings to a specific population which, in this study, is South Africa. In order to adequately answer the research question, the following research sub-questions were asked:

1. To what extent do teachers' use of specific reading instruction strategies affect learner reading comprehension achievement in the reading comprehension process of evaluation?
2. What is the relationship between the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study and Grade 4 learner reading literacy achievement as measured on two scales of reading ability?
3. What is the relationship between the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study and Grade 4 learner reading literacy achievement when controlling for school socio-economic status?

The sub-questions utilised the following questions from the teacher and school questionnaires of the PIRLS Literacy 2016 Study. These questions and their response options are outlined in table 1.

Question number	Question	Response option(s)	Source
R1A	How many learners are in this class?	_____ learners	Teacher questionnaire
R1B	How many of the learners in #R1A are in Grade 4?	_____ Grade 4 learners	Teacher questionnaire
R2	How many Grade 4 learners experience difficulties understanding spoken <language of test> ⁴ ?	_____ learners in this class	Teacher questionnaire
R3A	How many learners need remedial instruction in reading?	_____ Grade 4 learners in this class	Teacher questionnaire
R3B	How many of the learners in #R3A receive remedial instruction in reading?	_____ learners	Teacher questionnaire
R4	How many learners in the class are advanced readers?	_____ Grade 4 learners in this class	Teacher questionnaire
R6	In a typical week, how much time do you spend on	_____ minutes per week	Teacher questionnaire

⁴ In South Africa, each of the 11 official languages was tested and the languages were inserted here depending on which LoLT (Language of Learning and Teaching) was tested in the school. This language should correspond to the responding teacher's language of teaching in the class.

	<p><language of test> language instruction and/or activities with the learners? <i>Include instruction or activities in reading, writing, speaking, literature, and other language skills.</i></p>		
R7	<p>Regardless of whether or not you have formally scheduled time for reading instruction – in a typical week, approximately how much time do you spend on reading instruction and/or activities with the learners? <i>Include things you do across curriculum areas and during formally scheduled time for reading instruction.</i></p>	<p>_____ minutes per week</p>	Teacher questionnaire
R12	<p>How often do you ask learners to do the following things to help develop reading comprehension skills or strategies?</p>	<p>Check one circle for each line.</p> <ol style="list-style-type: none"> 1. Every day or almost every day 2. Once or twice a week 3. Once or twice a month 	Teacher questionnaire

		<p>4. Never or almost never</p> <p>a) Locate information within the text -----</p> <p>b) Identify the main ideas of what they have read -----</p> <p>c) Explain or support their understanding of what they have read -----</p> <p>d) Compare what they have read with experiences they have had -----</p> <p>e) Compare what they have read with other things they have read -----</p> <p>f) Make predictions about what will happen next in the text they are reading -----</p> <p>g) Make generalisations and draw inferences based on what they have read -----</p> <p>h) Describe the style or structure of the text they have read -----</p> <p>i) Determine the author's perspective or intention -----</p>	
ACBG03A	<p>Approximately what percentage of learners in your school have the following backgrounds?</p> <p>a) Come from economically disadvantaged homes</p>	<p>Check one circle for each line.</p> <p>0 to 10%</p> <p>11 to 25%</p> <p>26 to 50%</p> <p>More than 50%</p>	School questionnaire

ACBG03B	Approximately what percentage of learners in your school have the following backgrounds? b) Come from economically affluent homes		School questionnaire
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Table 3: Questions used from the teacher- and school questionnaires (2015)

4.5 Achievement Data Source

Plausible values were used to best estimate the learners' reading literacy achievement. "The average international reading score was set at 500 and the standard deviation at 100" (Howie et al., 2017, p.185). Plausible values are defined as values that resemble individual test scores and have approximately the same distribution as the latent trait that is being measured. The use of plausible values in this study is appropriate because it provides estimates of the learners' ability as seen in the PIRLS Literacy study, where learners received 12 passages and had to answer one or two questions based on the section just read before reading the next section (Howie et al., 2017). Thus, plausible values were used as approximations for learner reading literacy achievement.

The overall reading scale of the PIRLS study was determined by means of the plausible value. The PIRLS reading achievement scale can be described as an overall measure of reading proficiency that includes processes of comprehension and reading purposes (Martin et al., 2015). The PIRLS Literacy assessment measured the learners' "ability to undertake a number of reading comprehension processes" (Howie et al., 2017, p.65). Furthermore, the PIRLS studies provide data on trends in learners' reading literacy on a common achievement scale (Martin et al., 2015). The learner's achievement scores in the South African PIRLS Literacy 2016 study were low compared to that of other countries and very low once it was placed on the PIRLS scale (Howie et al., 2017). For this study, two reading scales were used to determine learners reading literacy achievement, and not the overall score. These scales were for *making straightforward inference* and *interpreting and integrating ideas and information*.

4.6 Sample

The PIRLS Literacy 2016 Study sample was already discussed in Chapter 2. As this study focuses on learners' reading literacy achievement and the possible impact of socio-economic status on literacy achievement, variables were purposely selected from the teacher and school questionnaires. The questions used were specifically selected based on usefulness or representativeness. This study used all this data, which means that the analyses were applied to all 12 810 learners' achievement data, 324 teacher questionnaires, and 293 school questionnaires as completed by school principals (Howie et al., 2016).

4.7 Alignment of instruments to research questions and framework

Table 2 details how the research questions were answered by each of the data sources, as well as their alignment with the conceptual framework.

Research Question	Instrument	Framework
To what extent do teachers' use of specific reading instruction strategies affect learner reading comprehension achievement in the reading comprehension process of evaluation?	Teacher questionnaire Variables: reading instruction strategies, learner reading comprehension achievement, the process of evaluation	School, classroom, Instruction and Experience, Learner reading achievement
What is the relationship between the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study and Grade 4 learner reading literacy achievement?	Teacher questionnaire Variables: reading instruction strategies, learner reading literacy achievement	School, classroom, Instruction and Experience, Learner reading achievement
What is the relationship between the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study and Grade 4 learner reading literacy achievement when controlling for school socio-economic status?	Teacher questionnaire Variables: reading instruction strategies, learner reading literacy achievement. School questionnaire School socio-economic status	School, Instruction and Experience, Learners reading achievement

Table 4: Alignment of instruments to research questions and framework

4.8 Data analysis

4.8.1 Descriptive statistics

Kaliyadan and Kulkarni (2019) define descriptive statistics as giving a summary of the sample that is being studied without drawing any inferences based on the probability theory. Franzese and Luliano (2018) define descriptive statistics as the primary step in any applied scientific investigation to simplify large amounts of data in a more sensible matter. Kaliyadan and Kulkarni (2019) add that descriptive statistics can help to summarise data in the form of simple quantitative measures, for example, percentages or means, or in the form of visual summaries like histograms and box plots. In this study, descriptive statistics was used to describe more than one variable and to summarise the relationships between these variables (Kaliyadan & Kulkarni, 2019). These summaries and variables are discussed in the next paragraph.

Descriptive statistics was applied to all variables as set out in the previous table. Some are presented merely to paint the context of what the classes look like, while the nine reading strategies and SES variable were used in the regression model.

Question number	Question	Categories
R1A	How many learners are in this class?	0-25 learners 26-50 learners
R1B	How many of the learners in #R1A are in Grade 4?	51-75 learners 76-100 learners
R2	How many Grade 4 learners experience difficulties understanding spoken <language of test> ⁵ ?	One quarter of learners Two quarters of learners More than three quarters of learners
R3A	How many learners need remedial instruction in reading?	One quarter of learners Two quarters of learners Three quarters of learners

⁵ In South Africa, each of the 11 official languages was tested and the languages were inserted here depending on which LoLT (Language of Learning and Teaching) was tested in the school. This language should correspond to the responding teacher's language of teaching in the class.

R3B	How many of the learners in #R3A receive remedial instruction in reading?	More than three quarters of learners.
R4	How many learners in the class are advanced readers?	
R6	In a typical week, how much time do you spend on <language of test> language instruction and/or activities with the learners? Include instruction or activities in reading, writing, speaking, literature, and other language skills.	0 minutes – 375 minutes per week 376 minutes – 750 minutes per week 751 minutes – 1125 minutes per week
R7	Regardless of whether or not you have formally scheduled time for reading instruction, in a typical week, approximately how much time do you spend on reading instruction and/or activities with the learners? <i>Include things you do across curriculum areas and</i>	0 minutes – 150 minutes per week 151 minutes – 300 minutes per week 301 minutes – 450 minutes per week 451 minutes – 600 minutes per week

	<i>during formally scheduled time for reading instruction.</i>	
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Table 5: Variables were used to describe the education setting

4.8.2 Inferential Statistics

Inferential Statistics help a researcher to make predictions and come to conclusions based on the data of the current study, while descriptive statistics summarise the characteristics of a data set (Bhandari, 2022). Aransiola (2023) and Bhandari (2022) write that inferential statistics is a branch of statistics that uses samples in data to make predictions or inferences about a population. Inferential statistics can further be defined as statistical procedures used to draw different conclusions about associations between variables (Bhattacharjee, 2016).

4.8.3 Factor analysis

Factor analysis was performed to help reduce the data of the nine reading instruction strategies (R12) into a more manageable size while still retaining as much of the original information as possible. Factor analysis enables the researcher to simplify a set of complex items or variables by using statistical procedures to explore the underlying dimensions that explain the relationship between the different items/variables (Tavakol & Wetzel, 2020). Lastly, the resulting factors were saved after the factor analysis for multiple regression analysis.

4.8.4 Regression analysis

Regression analysis provides insight into the relationships between different variables (Cote, 2021). Frost (2022) supplements this point by defining regression analysis as a mathematical description of the relationship between a set of independent variables (nine reading instruction strategies, while controlling for the socio-economic status of the school) and a dependent variable (Grade 4 learner reading literacy achievement of South African learners). Petchko (2018) defines multiple regression analysis as the method that allows a researcher to assess the strength of the relationship between several predictor variables and the dependent variable, and the importance of each predictor to the relationship. In addition, Pietersen and Maree (2020, p.294) say that multiple regression analysis is used in situations where “more than one independent variable is used to predict a single

dependent variable”. Gallo (2015) explains that the dependent variable, reading literacy achievement, is demonstrated in a graph on the y-axis. The nine reading instruction strategies will then be represented on the x-axis. The p-values and coefficients work together to show which relationships in the model are statistically significant, and what the nature of these relationships is (Frost, 2022).

Multiple regression analysis can be calculated as follows (Hayes, 2022):

$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_p x_{ip} + \epsilon$$

where, for $i=n$ observations:

y_i =dependent variable

x_i =explanatory variables

β_0 =y-intercept (constant term)

β_p =slope coefficients for each explanatory variable

ϵ =the model's error term (also known as the residuals)

The data analysis of the PIRLS Literacy 2016 Study was done by means of the International Database Analyzer (IDB) software. The Data Processing Centre (DPC) in Hamburg provided this software and support for the analysis of the final data (Howie et al., 2017). The IDB Analyzer was created for IEA (International Association for the Evaluation of Educational Achievement) data (Howie et al., 2017). This software can also be used in conjunction with SAS or SPSS to analyse data (Howie et al., 2017). “The IDB Analyzer can be used to merge files and compute a range of statistics, including percentages of learners in different subgroups and learner achievement in the different subgroups” (Howie et al., 2017, p.43). Lastly, the IDB Analyzer can also run more complex statistics such as percentiles, correlations and regressions, coefficients of achievement distribution, and discrete or cumulative benchmarks (Howie et al., 2017). SES was included in the regression model to control the possible effect of SES at school level.

4.9 Validity and Reliability

The findings of the study were valid and reliable. The data of the PIRLS Literacy 2016 Study were objectively interpreted through statistical analyses (Howie, et al., 2017). The international study centre implemented a rigorous quality assurance process (Howie, et al., 2017). Furthermore, the scoring of the data in the PIRLS Literacy 2016 Study was assured by reliability scoring and extensive monitoring by the CEA team (at the University of Pretoria) (Howie, et al., 2017). Howie et al. (2017, p.167) write that “the outcomes of all the

quality assurance processes indicate that the data and the processes involved in the PIRLS Literacy 2016 Study were valid and reliable”. The validity and reliability of the data were already established in the original PIRLS Literacy 2016 Study.

For purposes of this study, the reliability of the teacher and school questionnaire items was determined by Cronbach’s alpha reliability coefficient. Factor analysis indicates the extent to which construct validity can be ascertained for the nine reading strategies as taken from the PIRLS 2016 teacher questionnaire.

4.10 Ethics

Reading literacy is one of the Department of Basic Education’s priorities. “The Minister of Basic Education, Angie Motshekga, gave her consent at the beginning of the 2016 PIRLS Literacy project” (Howie et al., 2017, p.XIII). The Department of Basic Education allocated officials to assist the CEA at the University of Pretoria to obtain the latest information from EMIS (Education Management Information System) to enable Statistics Canada to draw up the national samples (Howie et al., 2017). For this study, the CEA granted the researcher permission to use the 2016 PIRLS Literacy data in this secondary analysis study. Ethical clearance was provided by the Ethics Committee of the Faculty of Education at the University of Pretoria, with ethical reference number EDU004/21. The data in the study was used and honestly and confidentially reported without attempting to make any changes to the existing data and avoiding any bias towards the intended study.

4.11 Conclusion

This chapter discussed a secondary data analysis research design used in a quantitative, postpositivist paradigm. PIRLS Literacy 2016 was the “fourth assessment in the current trend series” (Howie et al., 2017, p.XIII). In South Africa, Grade 4 learners took the less difficult PIRLS Literacy assessments, and sub-populations of Grade 5 learners participating in PIRLS as benchmarking participants (Howie et al., 2017). The learner questionnaires returned for all the languages tested were between 99% and 100%. A total of 12 810 Grade 4 learners participated in the study. PIRLS 2016 Literacy used a two-stage stratified cluster sampling design to select the samples used in this study. Different questionnaires were used to collect information for the PIRLS 2016 Literacy study, but this chapter reiterated that only the teacher and school questionnaires were used to determine the reading literacy achievement of Grade 4 learners in South Africa. Lastly, the process of analysis used to

answer the research questions was also explained, together with the statistical programs that assisted with analysis.

Chapter 5 - Data analysis

5.1 Introduction

The PIRLS Literacy 2016 Study was the fourth in a series of international comparative studies undertaken in a five-year cycle, and the first literacy study focusing on Grade 4 learners. The PIRLS studies started in 2001, but South Africa participated in 2006 for the first time. The purpose of the PIRLS Literacy study was to study the community, school, home, and learner factors associated with learners' reading achievement in the fourth grade. PIRLS is also a trend study that uses a selection of passages to assess literacy achievement.

This study aimed to establish the possible relationship between reading instruction strategies and Grade 4 learner reading literacy achievement for learners tested in the PIRLS Literacy 2016 Study when controlling for socio-economic status. A description of the use of specific reading instruction strategies is required, as well as how it affects learner reading comprehension achievement. Hence, this chapter mainly addresses the first research sub-question, namely:

To what extent do teachers' use of specific reading instruction strategies affect learner reading comprehension achievement in the reading comprehension process of evaluation?

This chapter also provides the descriptive results for the different variables selected for the sole purpose of this study in anticipation of the regression analyses described in this chapter. A comprehensive list of the different variables required for the regression model is also provided.

Section 5.2 presents descriptive results for the variables of *instruction* and *experience*, while descriptive results for *time on task/hours spent on instruction* variables are explained in Section 5.3. The descriptive results related to difficulties understanding the spoken language of the test are discussed in Section 5.4, and descriptive results for *school* and *classroom* explanatory variables are presented in Section 5.5. The nine reading instruction strategies and socio-economic status chosen for the study that represent the process dimension of the PIRLS framework are explained in Section 5.6. The reliability results are presented in Section 5.7. The results of the factor analysis and the multiple regression analysis are discussed in Sections 5.8 and 5.9. Section 5.10 concludes the chapter.

5.2 Descriptive results for the *instruction* and *experiences* variables

More than 340 000 learners, 16 000 teachers, and 12 000 schools across the world participated in the PIRLS 2016 study (Howie et al., 2017). In South Africa, 12 810 Grade 4 learners participated in the study (Howie et al., 2017). Of the learners who had participated in the South African PIRLS Literacy 2016 Study, 45% were taught by a teacher who has completed a qualification in post-secondary education compared to 26% internationally (Howie et al., 2017). Thirty percent (30%) of learners were taught by teachers with only a bachelor's degree compared to 60% internationally. Only 18% of learners were taught by teachers with a postgraduate degree compared to 26% internationally, and 7% of our learners were taught by teachers who did not meet the minimum requirements (Howie et al., 2017).

Howie et al. (2017) reported that 40% of South African Grade 4 learners have teachers with 20 or more years of experience. Internationally, 42% of Grade 4 learners have teachers with 20 or more years of teaching experience. Twenty-four percent of Grade 4 South African learners are taught by teachers who have at least 10 years, but less than 20 years experience. Only 23% of South African Grade 4 learners have teachers with less than 5 years' teaching experience. Thus, more than 60% of our learners are taught by teachers with 10 or more years of experience. Hence, Howie et al. (2017) reported that the PIRLS data revealed no statistically significant differences between learners' achievement and teacher experience.

Participants in the PIRLS Literacy 2016 Study consisted of 52% boys and 48% girls. The 2016 PIRLS Literacy assessments set two purposes for reading, namely reading for literacy experience, and reading to use and acquire information (Howie et al., 2017). The 2016 PIRLS Literacy assessments contain fictional passages for testing literacy experience and informational articles for the purpose of reading for information (Howie et al., 2017). The 2011 prePIRLS Grade 4 study showed a significant gender gap in terms of achievement (Howie et al., 2017), with the girls outperforming the boys in schools in South Africa. In 2016, girls achieved a score of 348 for higher-order *interpreting, integrating, and evaluating* questions, and the boys trailed by 51 points with a score of 297 (Howie et al., 2017). The girls also obtained 338 points in *interpreting, integrating, and evaluating* questions, with the boys earning 281 points (Howie et al., 2017). The girls outperformed the boys in 2016 and in 2011. Lastly, Howie et al. (2017, p.52) reported that "South Africa has the second-largest achievement gap between boys and girls after Saudi Arabia".

According to teacher reports, the number of learners who require remedial support differ by classroom. While most Grade 4 teachers thought that only a quarter of their learners needed remedial instruction, only 8.7% of teachers felt that more than three quarters of learners needed additional support. If a majority of Grade 4 teachers indicate that only one quarter of their pupils are in need of remedial support, it may be due to an overloaded curriculum, lack of awareness of weak readers in their classes, inconsistent measurement of reading abilities, or that the teacher does not regard remedial action a necessary intervention to improve weak readers.

Learners who need remedial support	N (Number of teachers/frequency)	Percentage (%)
One quarter of learners	9 194	71.8
Two quarters of learners	1 179	9.2
Three quarters of learners	38	0.3
More than three quarters of learners	1 115	8.7

Table 6: Learners who need remedial support

Table 2 indicates that more than two thirds of learners receive remedial support. This is a surprising finding, since most Grade 4 teachers do not have access to or the financial means to ask assistance from reading professionals or to appoint teacher's aids in the classroom. Thus, it can only be assumed that most teachers do remedial work themselves.

Learners who receive remedial support	N (Number of teachers/frequency)	Percent (%)
One quarter of learners	8 202	64.0
Two quarters of learners	466	3.6
Three quarters of learners	38	0.3
More than three quarters of learners	2 820	22.0

Table 7: Learners that receive remedial support

5.3 Descriptive results for *time on task / hours spent on instruction*

In the following paragraphs, the *time on task/hours spent on reading instruction* as reported by teachers is discussed. Howie et al. (2017, p.132) indicated that, in the South African PIRLS Literacy 2016 Study, "a total of 1 180 instructional hours per year were spent on all

subjects, with 20% (240 hours) of those hours spent on language instruction and 10% (122 hours) on reading instruction.” Of the 50 participating countries, “South Africa reported the most time spent on all subjects” (Howie et al., 2017, p.132). In contrast, the Russian Federation, which was the top-performing country in PIRLS 2016, reported spending 652 instructional hours per year on language instruction (42%) and reading instruction (27%) (Howie et al., 2017).

In the teacher questionnaire, the teachers were asked to indicate the minutes per week (time on task) spent on language instruction (in the language of the test⁶) and/or activities with their learners. Furthermore, the time on task was elaborated on and it also included instruction or activities in reading, writing, speaking, literature, and other language skills. According to the CAPS Grade 4 - 6 English Home Language document (DBE, 2012), in Grade 4, only 2.5 hours (0 - 150 minutes) must be spent on reading each week. The majority of teachers indicated that they spend 0 - 6 hours (0 - 375 minutes) per week on reading instruction (Figure 5.1). It is concerning that very few teachers devote more than 6 hours per week, and even less spend more than 12 hours (751 minutes) per week on reading instruction.

⁶ Language of the test refers to the language in which the learners were tested as determined by the school’s Foundation Phase Language of Learning and Teaching. For this reason, many learners were not tested in their home language.

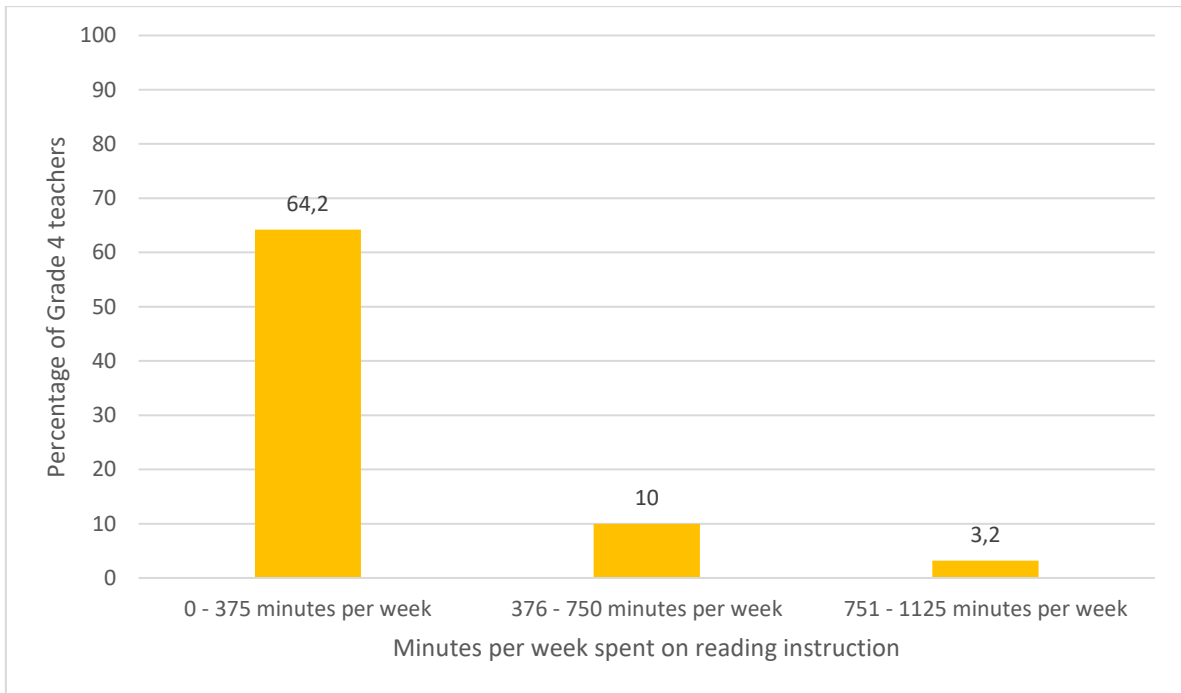


Figure 1: Minutes per week spent on reading instruction

The next question asked was how much time teachers spent on reading instruction and/or activities with the learners in a typical week. This included anything across the different curriculum areas during the formally scheduled time for reading instruction. According to the CAPS English Home Language document for Grade 4-6 (DBE, 2012), well-developed reading and viewing skills are seen as the central point for successful learning across the curriculum. In terms of time spent on reading instruction, the majority of Grade 4 teachers (44.3%, S.E. 2.06) stated that they spend 0 - 2.5 hours (0 - 150 minutes) per week on reading instruction and/or activities with their learners. A small minority of 3.1% said that they spend 7.5 - 10 hours (451 - 600 minutes) per week on reading instruction and/or activities with their learners.



Figure 2: Time spent on reading instruction and/or activities with the learners

Figures 1 and 2 show that, in the PIRLS Literacy 2016 Study, the majority of Grade 4 teachers spent the minimum amount of time on reading instruction and activities with their learners. The minority of teachers spent between 8 and 19 hours on reading instruction and activities with their learners. Figures 1 and 2 illustrate that teachers only spent the minimum time required by the Department of Basic Education on reading instruction and/or activities.

5.4 Descriptive Results for difficulties understanding the spoken language of the test

The Grade 4 teachers build on the foundation laid in Grades R to 3 (DBE, 2012). Many South African schools do not offer the home languages of all of their learners as Home Language but limit the choice to only one or two languages (DBE, 2012). As a result of the availability of Home Language instruction, the home language and the first additional language refer to the proficiency levels as taught by the school and not the native or acquired language (DBE, 2012). The learners in the classroom do not necessarily receive education in their home language. Despite this, the PIRLS Literacy 2016 Study tested in all eleven official languages. One of the questions in the teachers' questionnaires was "How

many Grade 4 learners experience difficulties understanding spoken <language of test>?”.

The majority of Grade 4 teachers (65.4%, S.E. 0.12) who participated in the study have learners in their classrooms who have trouble understanding the spoken language of the test. It could be that many learners received their education in their home language up to Grade 3 but had to change to another language (usually English or Afrikaans) when they progressed to Grade 4. According to Howie et al. (2017), 66% of South African Grade 4 learners who participated in the PIRLS Literacy 2016 Study speak the language of the test at home, while only 6% of Grade 4 learners in the South African PIRLS Literacy 2016 Study never speak the language of the test at home (Howie et al., 2017). A plausible reason why learners experience difficulties understanding the spoken language of the test could be because they change to another language when they progress to Grade 4.

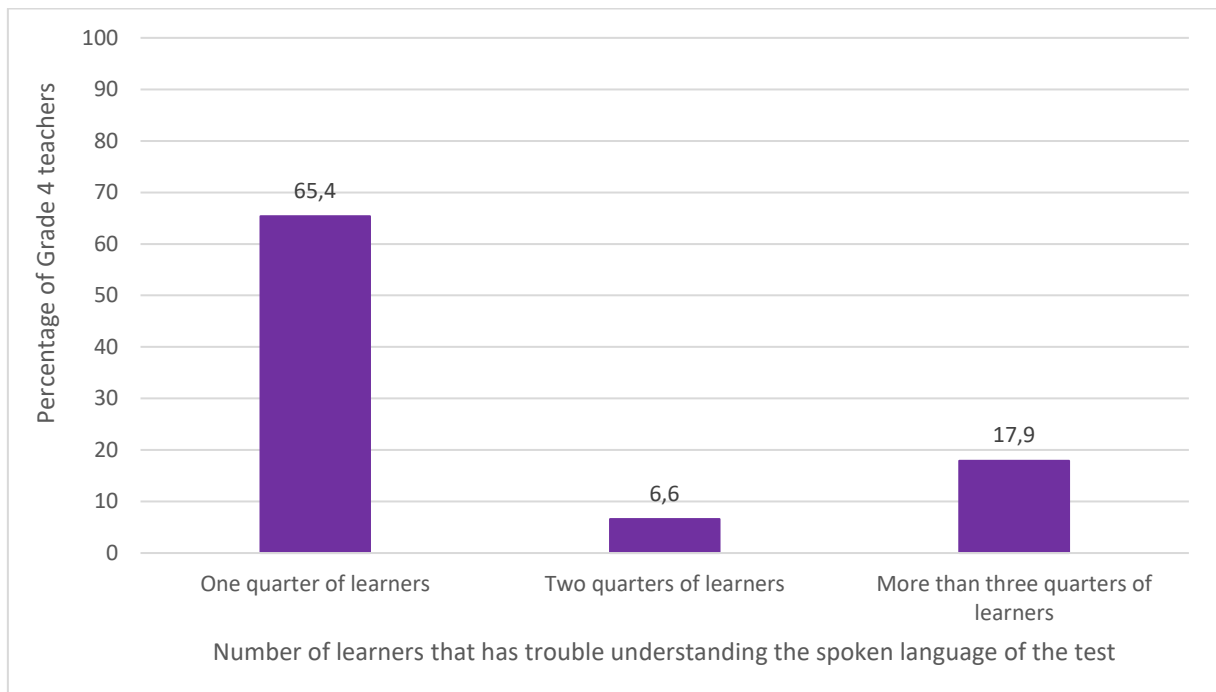


Figure 3: Number of learners who have trouble understanding the spoken language of the test

In the PIRLS Literacy 2016 Study, the teacher questionnaire asked teachers to indicate how many of their learners were advanced readers. According to Howie et al. (2017), learners who read at an advanced level achieved 625 and above points. This is the level at which learners integrate ideas and evidence across a text to appreciate overall themes, understand the author’s stance, and interpret significant events. The majority of Grade 4 teachers (45.3%, S.E. 0.15) indicated that only one quarter of the learners in their classroom

⁷ Language of the test referred to the language in which the learners were tested according to the Foundation Phase Language of Learning and Teaching of the school.

are advanced readers in their opinion. As little as 13.5% of teachers indicated that more than three quarters of learners in their class are advanced readers: this is a higher percentage than the 6% of 2011.

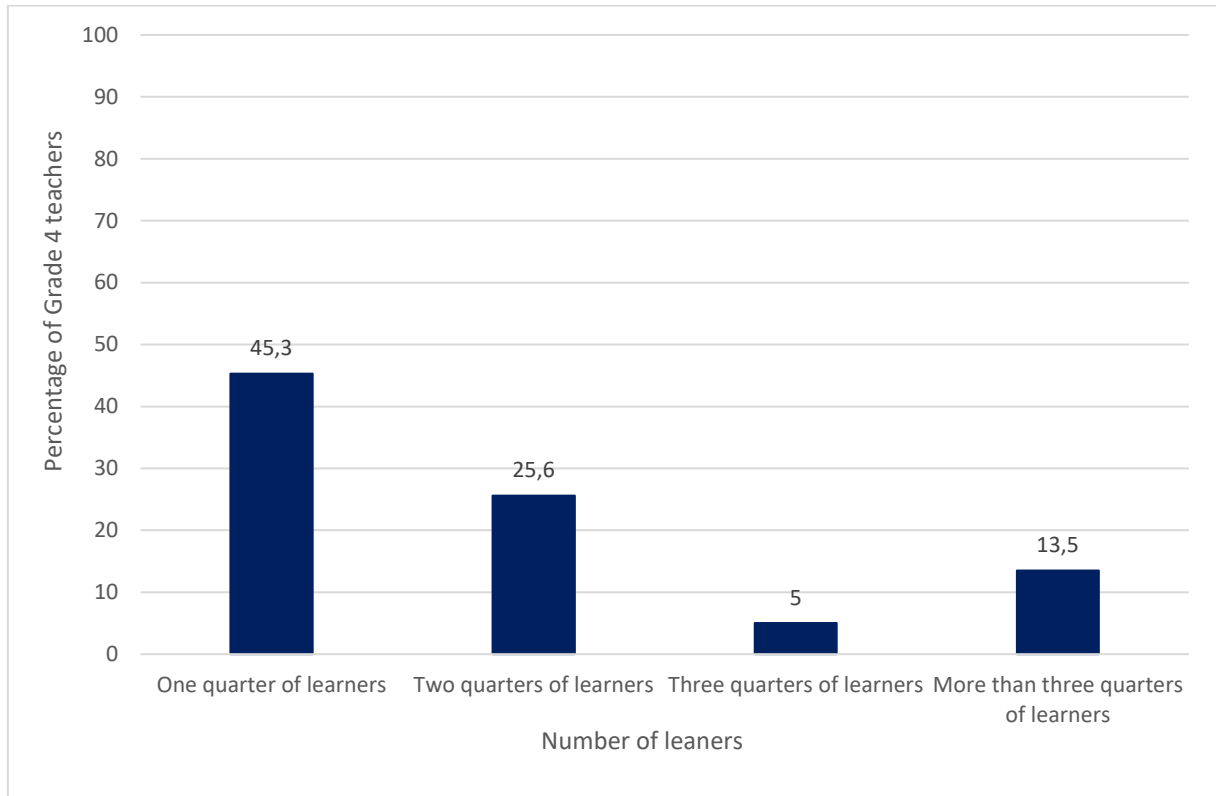


Figure 4: Advanced readers as reported by Grade 4 teachers

5.5 Descriptive Results for the classroom variables

A factor that can have an influence on learners' reading literacy achievement is the number of learners in a class. According to Howie et al. (2017), the average class size by province for the South African PIRLS Literacy 2016 Study was between 37 and 50 learners. The North West Province had the largest average class size with 50 learners per class, and the Northern Cape and Western Cape Provinces with an average of 37 learners per class (Howie et al., 2017). Furthermore, Afrikaans Grade 4 classes reported an average of 35 learners, which is the smallest average class size compared by language. SiSwati Grade 4 classes had 55 learners on average, which is the biggest average class size (Howie et al., 2017). Table 3 shows the teachers' responses about the number of learners in their classroom. The data were categorised into 4 categories: 0-25 learners, 26-50 learners, 51-75 learners, and 76-100 learners.

Number of learners in the classroom	Percentage
0-25 learners	3,3
26-50 learners	43,6
51-75 learners	24,9
76-100 learners	18,1

Table 8: Number of learners in the classroom

The majority of Grade 4 teachers (43.6%) indicated that they have 26-50 learners in their classroom. A much smaller percentage (3.3%) of teachers indicated that they have between 0-25 learners in their classrooms. Although no average classroom contained more than 55 learners on average, 18.1% of teachers indicated that they have between as many as 76 and 100 learners in their classrooms, and 24.9% of teachers indicated that they have between 51 and 75 learners in their class.

5.6 Socio-economic status and nine reading instruction strategy variables chosen for the study that represent the process dimension of the PIRLS Framework

Socio-economic status plays a significant role in learners' reading literacy achievement. The 2016 PIRLS Literacy School Questionnaire sought information about different aspects of the school, and the socio-economic surrounds in which the school is situated. Schools participating in PIRLS Literacy 2016 were divided into six categories, namely:

- "Urban – densely populated
- Suburban – on the fringe or outskirts of an urban area
- Township near the urban area
- Medium or large size city
- Small town or village; and
- Remote rural" (Howie et al., 2017, p.77).

According to reports by school principals, 39% (SE, 3.6) of Grade 4 learners attended schools in remote rural areas and 20% of learners are from urban or suburban areas (Howie et al., 2017). The remaining 41% of learners are from townships (near urban areas), or medium or large-sized cities or small towns/villages (Howie et al., 2017).

In the PIRLS Literacy 2016 Study, the school principals of Grade 4 learners were asked to indicate what percentage of learners in their schools come from economically disadvantaged homes and what percentage of learners in their schools come from economically affluent homes. The question had four categories and the principals should have chosen the relevant category that describes their learners best. Below is an example of the question:

Approximately what percentage of learners in your school have the following backgrounds? c) Come from economically disadvantaged homes	Check one circle for each line 0 to 10%
Approximately what percentage of learners in your school have the following backgrounds? d) Come from economically affluent homes	11 to 25% 26 to 50% More than 50%

Table 9: An example of questions ACBG03A and ACBG03B

The PIRLS Literacy 2016 Study found (Howie et al., 2017) that 75% of learners in the sample come from disadvantaged backgrounds, and 9% of learners in the sample come from affluent backgrounds. These percentages correlate with the type of location where schools could be found, where a majority of schools from remote rural and township areas are likely to be found in disadvantaged areas.

Low or no teaching and learning resources, safe and orderly aspects and other school environment aspects can be associated with inadequate school performance in Grade 4 learners. As much as 89% of school principals stated that “the inadequacy of school resources hampered the teaching and learning process” (Howie et al., 2017, p.172). Learners (Grade 4) who attended a school with somewhat inadequate levels of school resources received about 96 points lower than their peers in schools with no resource shortage (Howie et al., 2017). On average, Grade 4 learners achieved 53 points more if they attended schools with little or no problems in terms of the school environment, “compared to learners who attend schools with moderate to severe problems” (Howie et al., 2017, p.173). Lastly, the factors related to school climate and environment seemed to be significant in the PIRLS Literacy 2016 Study and were positively associated with the Grade 4 learners’ reading literacy performance, according to Howie et al. (2017).

In the school questionnaires, the principals were provided with a list of reading strategies and skills assessed by PIRLS Literacy 2016. They were also asked to indicate at which

grades these strategies and skills were prioritised for at least 50% of the learners (Howie et al., 2017). The principals of Grade 4 learners responded that seven out of the 14 strategies and skills are taught at the same grade in South Africa as internationally, and the remaining seven are taught in later grades in South Africa than internationally (Howie et al., 2017). The PIRLS scale indicates that a difference of approximately 40 points is equal to a year's schooling (Howie et al., 2017). Table 5 (Howie et al., 2017, p. 191) indicates the effect of teaching different reading strategies at different grades and clearly shows an effect on lower reading achievement when strategies are only taught as late as Grade 4.

“Reading Skills and Strategies	Grade 1 or earlier		Grade 2		Grade 3		Grade 4	
	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	298	9,4	273	12,3	299	4,9
Reading isolated sentences	338	7	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	318	7,5	309	6,5	283	16
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	318	7,6	304	7
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
Making generalisations and drawing inferences based on a text	346	18,5	342	19,6	325	8	307	8,9
Describing the style or structure of a text	362	45	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"

Table 10: The mean scores and Standard Error of Grade 1 - Grade 4 learners' Reading Skills and Strategies tested in the PIRLS Literacy 2016 Study (Howie et al., 2017, p.191)

The mean score can be expected to be as low as 359 (SE=15) if the reading strategy *Locating information within the text* was taught in Grade 1. If this skill was only taught in Grade 4, the mean score decreased to 283 (SE=16), which is 217 points below the international centre point. In Grade 1, the mean score was 374 (SE=18,7) for the reading strategies *Comparing a text with personal experience* and, if taught in Grade 4, it was 304 (70 points difference); 196 lower than the international centrepont. There is a statistically significant difference in the mean scores from Grade 1 to Grade 4 in terms of the nine reading strategies and skills tested in the PIRLS Literacy 2016 Study. If reading strategies were only taught in Grade 4, the mean scores of each of the nine reading strategies and skills tested in the PIRLS Literacy 2016 Study can be expected to be lower when comparing

it to these skills being taught in Grade 1 already. In figure 5, a comparison of Grade 1 and Grade 4 mean scores of the nine reading instruction strategies is shown against the international centrepoint of 500.



Figure 5: Comparison of Grade 1 and Grade 4 mean scores of the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study against the international centrepoint score

The following sections present the inferential results for the study, where the nine reading strategies and skills were regressed against two scale point scores (make straightforward inference scale and the interpret and integrate ideas and information scale) when controlling for the effect of SES. Section 5.7 presents the reliability results for the nine reading instruction skills or strategies, followed by the factor analysis that was performed to determine whether the nine reading instruction skills or strategies uniformly assessed the nine reading strategies and skills as a coherent scale. Section 5.9 closes the chapter with regression results.

5.7 Reliability results

The reliability of the nine reading instruction strategies question (R12) was measured using Cronbach's alpha. This is a common measure used to determine internal consistency (UCLA, 2021). Furthermore, Cronbach's alpha is often used with a Likert scale question in questionnaires to determine if the scale is reliable (Laerd, 2018). SPSS was used to determine Cronbach's alpha for question(s) ACBG03A and ACBG03B. Using SPSS to ensure the reliability of items selected for the current study, Cronbach's alpha is considered an appropriate internal consistency reliability process. This is because the selected items are measured using a Likert scale. Cronbach's Alpha has different ranges, to indicate the reliability coefficient of a scale. The level of reliability for the range 0.5 and smaller is unacceptable; 0.7 – 0.8 is acceptable, and 0.9 and higher is excellent.

Grade 4 teachers were asked to indicate how often they asked the learners in their class to do each of the nine reading instruction skills or strategies to help develop reading comprehension. These instruction skills and strategies included (Howie et al., 2017, p.132):

1. *“Locate information within the text;*
2. *Identify the main ideas of what they have read;*
3. *Explain or support their understanding of what they have read;*
4. *Compare what they have read with experiences they have had;*
5. *Compare what they have read with other things they have read;*
6. *Make predictions about what will happen next in the text they are reading;*
7. *Make generalisations and draw inferences based on what they have read;*
8. *Describe the style or structure of the text they have read; and/or*
9. *Determine the author's perspective or intention.”*

The following response options were used; 1) *Every day or almost every day*; 2) *Once or twice a week*; 3) *Once or twice a month* and 4) *Never or almost never*. Table 7 presents the reliability coefficients regarding the nine reading instruction strategies for the current study and indicates a satisfactory result.

Reliability	
Cronbach's alpha	N of items
0,894	9

Table 11: Cronbach's alpha of the nine reading instruction strategies

5.8 Factor Analysis Results

Once the reliability coefficient for the study was determined, factor analysis was done. The main purpose of factor analysis is to reduce the given data into a more manageable size while still retaining as much as possible of the original information as possible (Glen, 2023). Furthermore, factor analysis also allows researchers to simplify a set of variables/items using statistical procedures to explore the underlying dimensions that explain the relationship between multiple items/variables (Tavakol & Wentzel, 2020). Factor analysis was conducted to confirm that all nine reading instruction strategies and strategies tested in the PIRLS Literacy 2016 Study did not simply load on a single factor. Table 8 provides a detailed list of the nine reading instruction strategies factor analysis.

Component	Description	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings		
			% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	Locate information within the text	4.936	54.842	54.842	4.436	49.290	49.290
2	Identify the main ideas of what they have read	.942	10.461	65.303			
3	Explain or support their understanding of what they have read	.612	6.796	72.099			
4	Compare what they have read with experiences they have had	.601	6.676	78.776			

5	Compare what they have read with other things they have read	.535	5.942	84.718			
6	Make predictions about what will happen next in the text they are reading	.416	4.620	89.338			
7	Make generalisations and draw inferences based on what they have read	.364	4.040	93.378			
8	Describe the style or structure of the text they have read	.315	3.499	96.877			
9	Determine the author's perspective or intention	.281	3.123	100.000			

Table 12: A detailed list of the nine reading instruction strategies factor analysis

Table 8 indicates that almost half of the variance observed in reading literacy achievement can be attributed to learners' ability to *locate information within the text*. With increasing complexity of each of the nine reading instructional skills and strategies, smaller percentages of variance explain learners' reading achievement. The ability to *locate information in text* as a most basic skill still explains reading achievement performance and

it stands to reason that, if this skill is not in place, other more complex skills do not make the same (or larger) contributions in explaining reading achievement performance. Furthermore, the factor analysis indicated a strong component analysis for these variables. All nine factors have high positive correlations, which suggests that they all represent similar constructs. Table 9 lists the variables accordingly:

Component	Description	Component Analysis
1	Locate information within the text	.722
2	Identify the main ideas of what they have read	.777
3	Explain or support their understanding of what they have read	.725
4	Compare what they have read with experiences they have had	.795
5	Compare what they have read with other things they have read	.760
6	Make predictions about what will happen next in the text they are reading	.724
7	Make generalisations and draw inferences based on what they have read	.780
8	Describe the style or structure of the text they have read	.691
9	Determine the author's perspective or intention	.683

Table 13: Component analysis of the variables

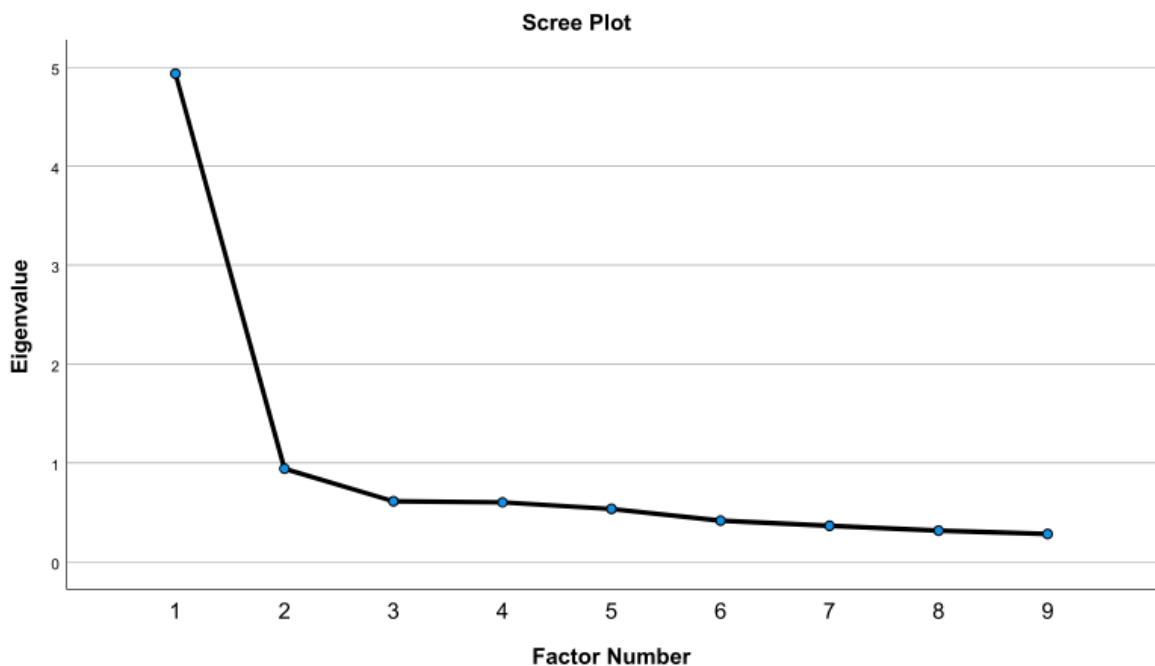


Figure 6: Scree plot of factor analysis

The scree plot in figure 6 confirms that there is only one factor for these items.

5.9 Multiple Regression Analysis Results

The International Database Analyser (IDB Analyser) was used to do the multiple regression analysis for the current study. The IDB Analyser was mainly developed for the IEA large-scale assessments such as TIMSS and PIRLS to analyse data (Howie et al., 2017).

To adequately interpret the regression analysis of the study, the following research sub-questions were formulated:

To what extent do teachers' use of specific reading instruction strategies affect learner reading comprehension achievement in the reading comprehension process of evaluation?

What is the relationship between the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study and Grade 4 learner reading literacy achievement as measured on two scales of reading ability?

What is the relationship between the nine reading instruction strategies tested in the 2016 PIRLS Literacy study and Grade 4 learner reading literacy achievement when controlling for school socio-economic status?

The formula for multiple regression analysis is as follows (Hayes, 2022):

$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_p x_{ip} + \epsilon$$

where, for $i = n$ observations:

y_i = dependent variable

x_i = explanatory variables

β_0 = y-intercept (constant term)

β_p = slope coefficients for each explanatory variable

ϵ = the model's error term (also known as the residuals)

In this study, Y is the dependent variable which, in this case, is learners' reading literacy achievement as measured on two scales namely make straightforward inference scale and the interpret and integrate ideas and information scale.

x_1 is the independent variable (explanatory variables), in this case, nine reading instructional strategies.

x_2 is an independent variable (explanatory variables), in this case, socio-economic status.

β_0 = y-intercept (constant term).

β_1 and β_2 are the regression coefficients that represent the change in Y per unit change in x_1 and x_2 , respectively.

ϵ = the model's error term (also known as the residuals).

Multiple regression analysis is a useful model by which to identify and predict learners' reading achievement as the outcome variable using multiple predictor variables. In this study, it was expected that each factor would influence the learner's reading achievement. These possible effects can be illustrated as follows:

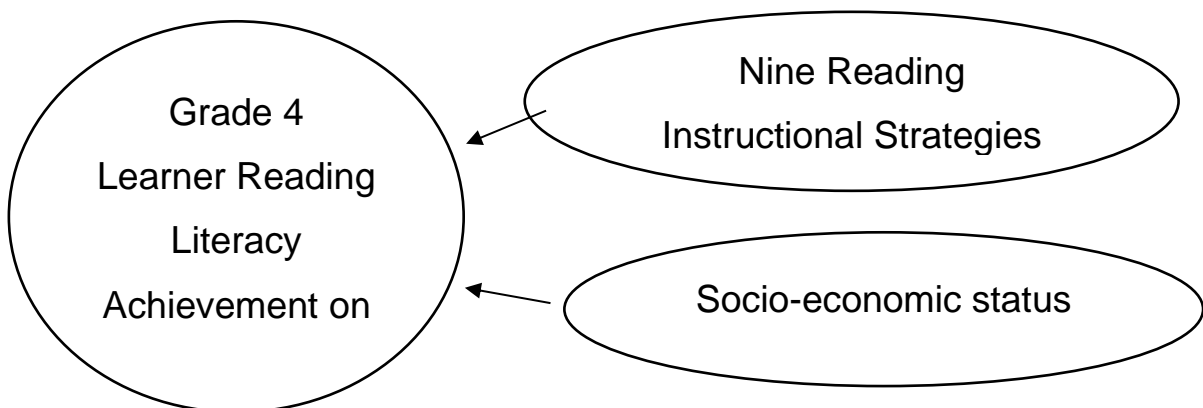


Figure 7: Factors that will influence the learners reading literacy achievement.

For the multiple regression model, two factors – nine reading instruction strategies and socio-economic status – serve as predictors of reading achievement as an outcome variable in this study. The analysis aims to provide insights into the relationship between Grade 4

learner reading literacy achievement and the nine reading instruction strategies when controlling for socio-economic status. Table 9 shows the relationship between the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study and Grade 4 learner reading literacy achievement on the scale for *making straightforward inferences* when controlling for school socio-economic status.

Variable	Regression Coefficient	Regression Coefficient (s.e.)	Regression Coefficient (t-value)
Make Straightforward Inference (CONSTANT)	378,79	32,19	11,77
Locate information within the text (ATBR12A)	-3,15	10,84	-0,29
Identify the main ideas of what they have read – (ATBR12B)	-6,84	13,94	-0,49
Explain or support their understanding of what they have read (ATBR12C)	-8,23	10,8	-0,76
Compare what they have read with experiences they have had (ATBR12D)	13,96	12,45	1,12
Compare what they have read with other things they have read (ATBR12E)	-4,93	7,26	-0,68
Make predictions about what will happen next in the text they are reading (ATBR12F)	-10,72	8,22	-1,3
Make generalisations and draw inferences based on what they have read (ATBR12G)	15,04	8,9	1,69
Describe the style or structure of the text they have read (ATBR12H)	13,47	8,62	1,56
Determine the author’s perspective or intention – (ATBR12I)	13,55	6,77	2
11-25% of learners from economically disadvantaged areas	-67,3	38,57	-1,74
26-50% of learners from economically disadvantaged areas	-79,75	28,65	-2,78
More than 50% of learners from economically disadvantaged areas	-120,48	25,28	-4,77

Table 14: Regression analysis of the nine reading instruction strategies using the Make Straightforward Inferences scale

The only statistically significant reading instructional strategy or skill in the current model was found for teachers who teach their learners how to determine the author's perspective

or intention. Grade 4 learners whose teachers engage in this activity stand to gain 13.55 points (SE=6.77, t-value is larger than 1.96) on the *making straightforward inferences* scale.

None of the other nine reading instructional skills and strategies in the current model shows statistical significance where teachers reported engaging their learners in reading instruction strategies when compared to making straightforward inferences as outcome variable. Learners stood to gain 13.96 points (SE=12.45) if they were taught to compare what they have read to their own experiences. So too did they stand to gain 15.04 points (SE= 8.9) when taught how to describe the style or structure of a text, but these were not statistically significant (t-value<1.96 and therefore not significant at the 0.05% confidence interval).

The inclusion of SES plays a significant role: for schools consisting of more than 26-50% of learners from economically disadvantaged backgrounds, reading literacy on the scale of *making straightforward inferences* scale can be expected to be 79.75 points (SE=28.65) lower than their affluent counterparts. So too when more than 50% of the school consists of learners from economically disadvantaged areas, with 120 points (SE = 25.28) lower than their affluent counterparts. While these values are statistically significant, they have to be interpreted with caution, since the SEs are larger than 20.

Variable	Regression Coefficient	Regression Coefficient (s.e.)	Regression Coefficient (t-value)
Interpret and Integrate Ideas and Information scale (CONSTANT)	380,18	35,85	10,6
Locate information within the text - ATBR12A	-5,91	12	-0,49
Identify the main ideas of what they have read - ATBR12B	-9,76	15,49	-0,63
Explain or support their understanding of what they have read - ATBR12C	-6,07	11,67	-0,52
Compare what they have read with experiences they have had - ATBR12D	15,74	13,85	1,14
Compare what they have read with other things they have read - ATBR12E	-4,27	8,03	-0,53
Make predictions about what will happen next in the text they are reading - ATBR12F	-11,89	8,68	-1,37
Make generalisations and draw inferences based on what they have read - ATBR12G	16,17	9,83	1,64

Describe the style or structure of the text they have read - ATBR12H	12,18	9,34	1,3
Determine the author's perspective or intention - ATBR12I	16,3	7,4	2,2
11-25% of learners from economically disadvantaged areas	-77,35	44,09	-1,75
26-50% of learners from economically disadvantaged areas	-96,18	32,12	-2,99
More than 50% of learners from economically disadvantaged areas	-138,2	28,23	-4,9

Table 15: Regression Analysis of the nine reading instruction strategies using the Interpret and Integrate Ideas and Information scale

Table 10 provides the results of the regression analysis done by means of the *Interpret and Integrate Ideas and Information* scale, which captures reading skills at a more complex level than the *Make Straightforward Inference* scale that was used earlier. The only statistically significant reading instructional strategy or skill in the current model was found for teachers who instructed their learners on how to determine the author's perspective or intention. Grade 4 learners whose teachers engage in this activity stand to gain 16.3 point (SE=7.4, t-value is larger than 1.96) on the *Interpret and Integrate Ideas and Information* scale.

When compared to *interpret and integrate ideas and information* inferences as outcome variable, none of the other nine reading instructional skills and strategies in the current model shows statistical significance where teachers report to engage their learners in reading instructional skills and strategies. Learners could gain 15.74 points (SE=13.85) if they were taught to compare what they have read to their own experiences. So too did they stand to gain 12.18 points (SE=9.34) when taught how to describe the style or structure of a text, but these were not statistically significant (t-value<1.96) and therefore not significant at the 0.05% confidence interval.

The inclusion of SES played a significant role: for schools that consisted of more than 26-50% learners from economically disadvantaged backgrounds, reading literacy on the *Interpret and Integrate Ideas and Information* scale can be expected to be 96.18 points (SE=32.12) lower than their affluent counterparts. The same applies when more than 50% of the school consists of learners from economically disadvantaged areas, which means a score of 138.2 points (SE = 28.23) lower than their affluent counterparts. While these values are statistically significant, they have to be interpreted with caution, since the SEs are larger than 20.

5.10 Summary

This study aimed to establish the possible relationship between reading instruction strategies and Grade 4 learner reading literacy achievement for learners when controlling for socio-economic status. The teacher questionnaire data probably lent itself to socially desirable answers where teachers were overly positive in their responses. This lack of variation in the data makes it difficult to detect any possible effects of classroom practice.

Instead of using the overall plausible value as reading outcome, this study used two reading scales: make straightforward inference scale and the interpret and integrate ideas and information scale. The aim was to see if predictors in the model reacted differently based on the complexity of the reading outcome scale. One would, for example, have expected an effect for the basic reading instructional skills and strategies on the scale for *making straightforward inferences*, or that the more complex reading instructional skills and strategies would have been good predictors of reading literacy performance on the *interpreting and integrating ideas and information* scale. But, surprisingly, it did not make a difference and the only statistically significant predictor on both reading scales was if teachers taught their learners the skill of determining the author's perspective or intention.

SES makes a substantial and statistically significant difference and, unfortunately, overrides any other effects that could have been observed in either of the two models across the nine reading instructional skills and strategies.

Chapter 6 - Discussion, conclusions, and recommendations

6.1 Introduction

The primary aim of this study was to examine and understand the relationship between reading instruction strategies and Grade 4 reading literacy achievement by using PIRLS Literacy 2016 data when controlling for socio-economic status. The nine reading instruction strategies used in this study are the nine strategies tested in the PIRLS Literacy 2016 Study. This study did not use the overall reading scale as an outcome variable but used the scales, *making straightforward inferences* and *interpreting and integrating ideas and information*, to determine the learners' reading literacy achievement. Secondary data analysis was used to analyse the Grade 4 South African learner achievement data and the contextual data was found in the teacher and school questionnaires. The sample data of the primary study of 12 810 Grade 4 learners were used for this study. Chapter 2 gave a broad description of the PIRLS studies and Chapter 3 was the literature review for the current study. Chapters 4 and 5 covered the data analysis procedure and presented the descriptive and regression results.

Chapter 6 provides a summary of the study in section 6.2 and includes an overview of the information that led to the research questions and design. In section 6.3, the results are related to the research questions. Section 6.4 is a reflection on the conceptual framework and methodology used in this study. A discussion of the strengths and limitations of the study is discussed in section 6.5, followed by the main conclusion of the study in section 6.6. Section 6.7 concludes the study.

6.2 Summary of the research

One of the Department of Basic Education's priorities is reading literacy. Grade R to 3 teachers lay the foundation Grade 4 teachers build upon (DBE, 2012). The majority of South African learners do not receive home language education in school, but schools do offer education in one or more languages at home language level (DBE, 2012). Therefore, the home language or additional language refers to the proficiency level and not the native or acquired language (DBE, 2012). The Department of Basic Education (2012) maintains that a learner should master well-developed reading skills to facilitate successful learning and full participation in the community and the work setting.

Different factors can affect learners' reading literacy achievement, one of which can be the number of learners in a class. The PIRLS Literacy Grade 4 study determined that the average class size in South African schools by province was between 37 and 50 learners (Howie et al., 2017). Another factor might be the professional development of teachers and their ability to support and teach learners who experience reading difficulties (Phala, 2023). Therefore, learners who struggle to read and receive remedial support may struggle to understand what is being read and, instead of improving, an incompetent teacher could exacerbate the problem. Klapwijk and Van der Walt (2011) concur, arguing that teachers rarely teach reading instruction strategies explicitly, and thereby deprive learners of the strategies they need to think about and use in the process of making meaning of a text. Furthermore, De Lange et al. (2020) conducted a study to determine how South African teachers understand and use reading strategies in their classrooms. The findings were that the teachers who participated in the study, only used a small number of different reading strategies in their classrooms (De Lange et al., 2020). They also found that only a few of the participating teachers implemented and understood different reading strategies (De Lange et al., 2020).

According to Ngure (2019), one of the essential aspects of ensuring that learners acquire reading skills is reading strategies. The Curriculum and Assessment Policy Statement (CAPS) states that all learners must be taught reading strategies to help with decoding of written text and to read with understanding (DBE, 2012). Klapwijk (2015) writes that skilled readers make use of several reading strategies at once and that reading strategies cannot be used in isolation. Howie et al. (2017) add to Klapwijk (2015) and write that, when learners use cognitive reading strategies, they use existing knowledge, re-read, and are able to alter their reading speed to support their comprehension. Furthermore, Zhang and Guo (2020) argue that cognitive reading strategies are directly related to learners' world of knowledge and their target language, allowing them to perform different given tasks and construct meaning from texts. Lastly, the use of different strategies ensures learners conduct different reading comprehension tasks that enable them to comprehend different written texts, which is better known as reading instructional strategies.

When teachers deliberately use instructional strategies in collaboration with the vision of the Department of Basic Education, it might improve reading comprehension. Banditvilai (2020) sees reading strategies as essential to ensuring learners' reading comprehension. Teachers must set up different reading comprehension activities so that learners will understand the materials that they must engage with (DBE, 2012). Furthermore, reading

comprehension is an important aspect of ensuring successful progression in reading. Teachers should be educated to better utilise more advanced reading comprehension strategies in the foundation and intermediate phases of schooling (Howie et al., 2017).

6.3 Summary of research questions and results

6.3.1 The main research question for the study

What is the relationship between reading instruction strategies and Grade 4 learner reading literacy achievement when controlling for socio-economic status for learners tested in PIRLS Literacy 2016?

6.3.2 The first sub-question of the study

To what extent do teachers' use of specific reading instruction strategies affect learner reading comprehension achievement in the reading comprehension process of evaluation? This question is intended to explore the extent to which teachers' use of specific reading instruction strategies affects Grade 4 learners' reading comprehension achievement in the process of evaluating reading comprehension in the PIRLS Literacy 2016 Study.

Four broad-based comprehension processes are integrated into the PIRLS Literacy 2016 Study to assess reading comprehension. Howie et al. (2017) identified that learners in South Africa performed notably better in the comprehension process of *retrieving and straightforward inferencing*, which is on a lower order level than the *evaluate and critique content and textual elements* comprehension process, which is a higher-order skill. In the current study, the overall achievement of the processes of comprehension was not used as an outcome variable, but rather each of the reading scores of each process of comprehension. In the PIRLS Literacy 2016 Study, Howie et al. (2017) identified that teachers used three of the nine reading instruction strategies most frequently, namely, *how to locate information within texts*, *identify main ideas*, and *explain or support the learner's understanding of what they have read*. In the data analysis, it was found that almost half of the observed variance in reading literacy achievement is the learners' ability to *locate information within the text* on the *make straightforward inferences* scale. Furthermore, the ability to *locate information within the text* is still seen as a most basic skill and it is important for this skill to be in place to facilitate the development of more complex skills.

6.3.3 The second sub-question of this study

What is the relationship between the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study and Grade 4 learner reading literacy achievement as measured on two scales of reading ability? This question is intended to determine if there is a relationship between the nine reading instruction strategies that were tested in the PIRLS Literacy 2016 Study and Grade 4 learner reading literacy achievement measured on the *Interpret and integrate Ideas and information* scale and the *Make Straightforward Inference* scale of reading ability.

The factor analysis that was done on all nine reading instruction strategies had a high positive correlation and shows that all represented similar constructs. *How to determine the author's perspective or intention* was the only statistically significant reading instructional strategy or skill found for teachers of the nine strategies on the *Make straightforward inferences* scale. Grade 4 teachers who engaged in this strategy stood to gain 13.55 points (SE=6.77, t-value is larger than 1.96) on this scale.

The scale for *interpreting and integrating ideas and information* captures the reading skills at a more complex level than the scale for *making straightforward inferences*. Of the nine reading instruction strategies on the *interpreting and integrating ideas and information* scale, *How to determine the author's perspective or intention* was the only strategy that yielded a statistically significant result. Grade 4 teachers who applied this strategy stand to gain 16.3 points (SE=7.4, t-value is larger than 1.96) on this scale. None of the other reading strategies tested in this study showed statistical significance when compared to the *interpret and integrate ideas and information* (inferences) scale as the outcome variable.

6.3.4 The third and last sub-question of this study

What is the relationship between the nine reading instruction strategies tested in the PIRLS Literacy 2016 Study and Grade 4 learner reading literacy achievement when controlling for school socio-economic status?

Finegan et al. (2018) refer to socio-economic status as an individual's level of prestige or resource in relation to others. An individual's SES can be measured via income, social hierarchy, level of education, or occupation. According to Howie et al. (2017), the home environment tends to be an important factor in a learner's reading literacy achievement. Controlling socio-economic status in a highly economically differentiated country such as

South Africa gave a clearer understanding of how different teaching strategies were affecting learners from the different school, classroom, and home contexts.

SES was included in the study and played a role in schools where more than 26-50% of the learner population came from economically disadvantaged backgrounds. On the *make straightforward inferences* scale, reading literacy could be expected to score 79.75 points (SE=28.65) lower, and on the *integrate ideas and information* scale, it could be expected to score 96.18 points (SE=32.12) lower than their affluent counterparts. The learners from socio-economic disadvantaged backgrounds performed better on the lower-order level than on the higher-order level. These values are statistically significant, but they should be interpreted with caution because the SEs are greater than 20.

6.4 Conceptual framework and methodology

6.4.1 Conceptual framework of the study

The conceptual framework used in this study was also used in the PIRLS 2011 study. The framework was used to analyse the 2016 PIRLS Literacy data. This framework provided an appropriate conceptual model that guided this study. In the framework, national and community context reflects the importance of the impact on the instructional experiences of the learners. The national and community context reflects the school, classroom, and home of the learner. Furthermore, one aspect that the study focused on was inferential and evaluative reading comprehension and how it affects teachers' choice of the reading strategies used in their classrooms in different socio-economic contexts in South Africa. Learners' attitudes and behaviours were not directly examined in this study, but it forms part of the framework and indicates that these aspects most likely influence the learning and teaching activities that were central to the research focus of the current study.

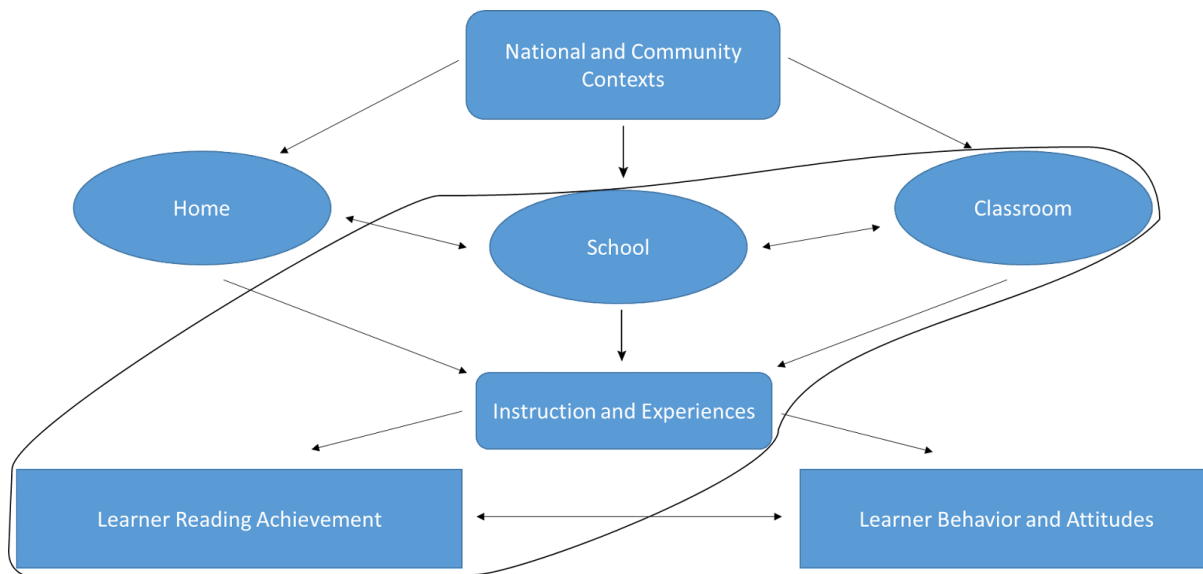


Figure 8: A conceptual framework for PIRLS 2011 (Mullis et al., 2009)

Figure 1 illustrates the relationship that can be associated with learners' literacy achievement. For example, teachers' use of different reading instruction strategies can either lead to improving learners reading literacy achievement or poor learners' reading literacy achievement. The effect of the school is clearly of great importance in terms of where the school is situated and whether or not more (rather than fewer) children are affected by coming from socio-economically disadvantaged backgrounds.

6.4.2 Methodology of the study

The postpositivist paradigm was selected as research design for this study to determine the extent to which teachers' use of different reading instruction strategies affects the learners' reading comprehension achievement in the processes of comprehension. The data of the PIRLS Literacy 2016 Study consisted of numerical data and therefore gave the researcher the opportunity to apply different statistical techniques to attempt to answer the research questions of the current study. Factor analysis was done on all nine reading teaching skills and strategies tested in the PIRLS Literacy 2016 Study and indicated a strong component analysis for all the variables. Multiple regression analyses were also used in the study. The model had two factors – nine reading instruction strategies and socio-economic status – which served as predictors of the reading achievement as outcome variable. The quantitative analysis was done to determine insights regarding the research questions of the study.

6.5 Strengths and limitations of the study

6.5.1 Strengths

The Progress in International Reading Literacy Study studies provide valuable insights into literacy levels and trends across different countries, and it highlights the strengths and areas of improvement in education systems across the world. PIRLS offers a unique opportunity for countries to compare the reading literacy of their learners. The use of a common assessment framework and methodology allows policymakers, educators, and researchers to form a comprehensive understanding of how the different education systems perform and teach reading in terms of reading comprehension skills. PIRLS 2016 invited the participation of numerous countries worldwide, allowing for comprehensive international comparisons of reading literacy performance. This broad scope enhances the study's generalisability and provides a robust basis for understanding reading achievement across nations. This study made use of the PIRLS Literacy 2016 data, which builds on the information and research of large-scale studies that have been done over many years.

The strength of the study is also indicated in the quality assurance done by the IEA for the data of the PIRLS Literacy 2016 Study. Furthermore, this study used South African data that was processed by the CEA at the University of Pretoria. The study also used two reading scales to do the multiple regression analysis instead of the overall plausible value as reading outcome. The data had positive correlations when it was analysed. This study tried to determine the gaps in the South African Grade 4 reading curriculum and aimed to show that teachers mostly make use of lower-order level reading skills and strategies instead of higher-order level reading skills and strategies. This study also showed that learners from socio-economically affluent areas performed better in reading comprehension than learners from socio-economically disadvantaged areas.

6.5.2 Limitations

In the study, only data that was obtained from the teacher and school questionnaires were used to collect information about reading achievement, the nine reading instructional strategies, reading literacy achievement, and socio-economic status of the learners. In the teacher questionnaire, the teachers were overly positive in their responses, which probably lent itself to socially desirable answers. This lack of variation in the data makes it difficult to detect any other possible effects of classroom practice. Only two reading scales were used in the analysis of the data, which left the other two scales open for interpretation. These scales could also be important variables in the relevant study, but were not analysed due

to the nature of the study. Another limitation to this study is the fact that the 2016 PIRLS Literacy data was used. This is because the researcher started the study before the 2021 results were available.

6.6 Main conclusions

One of the aspects the PIRLS Literacy 2016 Study tested was learners' abilities to undertake different reading comprehension processes (Howie et al., 2017). The PIRLS studies are based on two purposes for reading, which is (1) reading for literary experience and (2) reading to acquire and use information (Howie et al., 2008). The PIRLS Literacy study is an international assessment system that assesses the quality of reading and comprehension of Grade 4 learners worldwide every five years (Egamberdiyevna, 2022).

According to Howie et al. (2017), learners use different ways to locate the content of the text and understand the content that is relevant to the question in the process of *focusing on and retrieving explicitly stated information*. In the learners' booklets, the items that specifically tested this process required the learners to focus on word, sentence, and phrase levels for the sole purpose of constructing meaning (Howie et al., 2017). The other process, *making straightforward inferences*, allows the learners to resolve gaps in meaning and then move beyond the surface of the text (Howie et al., 2017).

The aim of the study was to see if there were predictors that reacted differently based on the complexity of the different reading outcome scales. One of the expectations for the study was that there would be an effect on the basic reading instruction strategies and skills on the *make straightforward inference* scale, which is the basic reading scale. Another expectation was that the more complex reading instruction strategies and skills would be good predictors of learners' reading literacy performance on the *interpreting and integrating ideas and information* scale. Surprisingly, there was no difference and the only statistically significant predictor on the two reading scales was if teachers taught the learners the skill of *determining the author's perspective or intention*. Lastly, the socio-economic status of the learners made a statistically and substantially significant difference, and therefore, unfortunately, overrode any other effects that could be observed in the reading scales across the nine reading instructional strategies.

6.7 Recommendations

The results of this study yielded several recommendations for schools. This study focused on teachers' use of different reading instructional strategies, Grade 4 learner reading literacy achievement, and learners' socio-economic status. The recommendations are also valid for teachers, as they are also responsible for learners' reading literacy achievement. Chapter 5 discussed the data analysis of the current study. The following paragraphs reflect on some of the findings along with recommendations for schools and teachers.

The majority of Grade 4 teachers (44.3%, S.E. 2.06) indicated that they spent the minimum amount of time on reading instruction and activities with their learners (0-25 hours per week). It is likely that most teachers only spend the CAPS requirement of 2.5 hours on this and no more. The response category for this question makes provision for up to 6 hours, but this does not necessarily mean that we have teachers who spend that much time on reading. This study also found that, according to the teachers tested in the PIRLS Literacy 2016 Study, they spent the minimum time required on reading instruction as set out by the Department of Basic Education. The response categories for this question should make provision for more specific feedback to determine precisely how much time teachers spend on teaching reading per week.

The teacher questionnaire asked teachers to indicate how many of the learners in their Grade 4 classroom are advanced readers. The majority of teachers (45.3%, S.E. 0.15) indicated that, in their opinion, one quarter of their learners are advanced readers. Teachers were also asked about the number of learners in the classroom who require remedial support. 8.7% of teachers indicated that more than three quarters of their learners need remedial support and 71.8% indicated that only one quarter of their learners need remedial support. Govender and Hugo (2020) add to this by stating that, for learners who are weak readers, it is often too late for effective remedial instruction. Chetty (2019) also did a study in the Western Cape and found that, in some cases, the curriculum schedule in schools were too rigid and there was no time for remedial support. Teachers also do not necessarily measure reading ability and the need for remedial support the same. Teachers should integrate subjects more effectively to ensure the learners grasp key concepts. Teachers should receive more training in remedial support to integrate it into their day-to-day learning and teaching.

According to Pretorius and Klapwijk (2016), there are multiple reasons for the poor reading comprehension levels of South African learners. Van der Berg et al. (2019) state that

developing countries usually consider it better to devote more resources to remediation, but these countries usually do not have the resources for remediation. Zimmerman (2014) conducted a study to better understand the teaching of reading comprehension in Grade 4, and arrived at a number of conclusions. These were that teachers do not necessarily know how to effectively teach reading comprehension, socio-economic needs also play a role, and that teaching and learning reading literacy should focus on exposure to the development of higher order comprehension and not just on decoding and basic understanding of words.

6.8 Concluding thoughts

The main purpose of this thesis was to present arguments on reading instruction strategies and how these are related to Grade 4 learner reading literacy achievement when controlling for socio-economic status for learners tested in the PIRLS Literacy 2016 Study. The study indicated learners' reading literacy achievement and how teachers' use of different reading instruction strategies influence it. The socio-economic status of learners was also proven to have an impact on Grade 4 reading literacy achievement.

The literature shows that South African teachers do not necessarily use different reading instruction strategies when teaching learners. It is also clear that from Grade 1 to Grade 4, learners' reading scores drop significantly, which influences learners reading literacy achievement. Learners also performed better in lower-order than higher-order reading strategies. The schooling system of South Africa should move from a teaching and learning model where the teacher is placed at the core of education to a learning and teaching model where the learner is placed at the core of the education. This will improve learners' metacognitive abilities and learners as well as teachers would be responsible for their learning. The literature showed that teachers do not necessarily have the knowledge of the different reading strategies used to teach Grade 4 reading.

The conclusion of the main study was that the socio-economic status of learners is dominant and that none of the reading instruction strategies had a statistical effect. The socio-economic status of schools will only improve when the Department of Basic Education starts intervening and improving the quality of the facilities where education takes place. The literature clearly showed that most schools tested in the PIRLS Literacy 2016 Study were from the Quintile 1, 2, and 3 categories, which are remote areas, small towns or villages, or a township near an urban area. This emphasises the importance of good school facilities

and resources, as many children do not have any of these at home to meet their educational needs.

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