• *Article* •

Interpretation of the PIRLS Assessment Framework and Exploration of Reading Instructional Strategies Under the PIRLS Philosophy

Yingning Wang[1],*

[1] Shanghai Normal University, Shanghai, China

* Corresponding Author: Yingning Wang. Email: 1581223780@qq.com

Abstract: The PIRLS assessment framework is a crucial indicator in the PIRLS assessment system, playing a key function in gauging the development and improvement of students' reading abilities in numerous nations. This paper will certainly disclose the academic keystones of PIRLS, including the meaning of reading literacy, 2 kinds of reading purposes and 4 processes of reading comprehension. Through an in-depth analysis of a series of good teaching practices, it will explore what reading instructional strategies teachers can use under the PIRLS concept into practice, including returning the right to ask questions to students, structuring the handling of reading instruction, enriching reading courses, encouraging students to enjoy and delve into reading, in order to stimulate students to read actively and think critically so as to enhance their reading literacy.

Keywords: PIRLS; Reading Instructional Strategies

1. Introduction

The Progress in International Student Reading Literacy Study, or PIRLS, acts as a major worldwide comparative research performed by the International Association for the Evaluation of Educational Achievement (IEA) to analyze the analysis reading literacy of grade school students worldwide and to determine pupils' analysis comprehension abilities. Via 2021, PIRLS specifies reading literacy as the ability to understand and use those written language forms required by society and/or valued by the individual. Readers can construct meaning from texts in a variety of forms. They read to learn, to participate in communities of readers in school and everyday life, and for enjoyment. The PIRLS definition of reading literacy reflects the multidimensional importance of reading skills in personal growth and social participation. It emphasizes the need for readers to be able to not only comprehend the written word, but also to be able to use that comprehension to meet social needs or realize personal values. This ability motivates readers to not only absorb information, but to use their initiative in the reading process to distill meaning from different texts and thus develop their own insights.

2. Instructional Research Done Around PIRLS Reading Literacy

Based on PIRLS 2016 data, Zakaria, Murad et al. found that reading literacy of elementary school students is greatly influenced by the learning atmosphere provided by teachers and the learning environment provided by schools through variable analysis, emphasizing that teachers should provide students with a safe and orderly learning atmosphere, and that schools should pay attention to students' learning and provide students with a disciplined learning environment. Joao Marôco found that instructional strategies play a large role in influencing students' reading literacy by studying PIRLS data from various countries. In the Russian survey, giving students quiet time to read was an effective reading instructional strategy; in the Portuguese survey, teachers helping students locate reading information can help students' reading literacy; and in countries such as Slovakia, word-decorating strategies (in which teachers allow students to comprehend the various types of modifiers in their reading) are an effective way to improve students' reading literacy. However, Gerry Shiel found that the results of the PIRLS study showed no direct correlation between how often reading strategies were taught and how well students performed in reading achievement. PIRLS 2006 showed that 35% of British students who "never or almost never" answered questions about reading in class had higher average reading scores than British students who participated in this activity once or twice a day or week. This suggests that we should not focus on the 'quantity' of reading strategies taught at the expense of the 'quality' of reading strategies taught. When teaching reading strategies, we should focus on students' knowledge of the strategies and their confidence in using them.

Lopes and Oliveira et al. found that student variables were better predictors of reading achievement than school variables after a multilevel analysis. In terms of individual students, students' reading confidence was the best single predictor of reading ability and reading achievement, and students' attitudes toward reading and engagement in reading were also important factors in their growth in reading literacy and improvement in reading achievement. Based on information from PIRLS 2011 in Sweden, Stefan Johansson checked out the connection in between fourth-grade students' reading accomplishment degrees, instructor specialization, and pupils' understandings of training top quality, and discovered that teacher expertise was significantly and positively associated with students' analysis success levels; however, because of the restricted degree of prediction of pupils' perceptions in the fourth grade, no significant relationship was located between the level of students' perceptions of educational high quality and However, because of the minimal anticipating degree of students' understandings in the fourth grade, no substantial correlation was located in between students' viewed top quality of teaching and their reading accomplishment level, which is slightly different from the results of previous research studies. Focusing on positive emotions of satisfaction, Geetanjali Basarkod and Herb Marsh et al. discovered two possible predictors of happiness: individual student achievement and class grade point average, and used information from the large-scale study of PIRLS in demonstrating whether the findings are generalizable and suitable throughout countries and domain

names. The outcomes of the study located that student-level achievement had a positive impact on student pleasure, while class-level achievement had a negative impact on pupil satisfaction.

3. 3. PIRLS Reading Literacy Assessment Framework

According to the PIRLS assessment framework[] issued by the IEA Organization in 2021, the PIRLS analysis proficiency evaluation structure is mostly divided right into two reading purposes and 4 reading comprehension processes, which are cascaded into four analysis comprehension processes, each of which is a type of reading comprehension skill.

3.1 Two Reading Purposes

PIRLS includes two reading purposes: reading for the literary experience, reading for acquire and use of information. The following is an expansion of these two purposes.

3.1.1 Reading for the Literary Experience

Literary reading is a deep engagement in which the reader not only enters the text, but empathizes with the characters, events, and emotions of the story and enjoys the beauty of the language. Understanding literature requires the reader's personal experience, emotions, appreciation of language, and knowledge of literary styles.PIRLS uses primarily narrative fiction, a form that helps readers better understand and appreciate literature.

3.1.2 Reading for Acquire and Use of Information

Informational texts are intended to convey information and serve a variety of functions, including the direct statement of facts or the expression of subjective opinions. Authors may convey information through summaries, persuasive essays, or balanced arguments. Readers need to think critically in order to form their own opinions.

With the demands of the digital age, PIRLS also emphasizes students' information retrieval skills on the Internet. Students need to have the skills to identify and select sites that match their needs and to have some information evaluation skills. In the face of the vast amount of information texts on the Internet, students need to analyze in depth and understand the relevance of various texts and information.

3.2 Four Reading Comprehension Processes

PIRLS includes four processes of reading comprehension: focus on and retrieve explicitly stated information, make straightforward inferences, interpret and integrate ideas and information, evaluate and critique content and textual elements. The following is an expansion of these four processes.

3.2.1 Focus on and Retrieve Explicitly Stated Information

The capacity to concentrate on and get plainly mentioned information is basic to the building of message. In general, readers rely greatly on discovering details supplied directly in the message, which is usually clearly visible and may be hidden in individual words or sentences that can be extracted

directly without additional parsing or inference. An effective retrieval process requires immediate comprehension of words, phrases, or complete sentences, ensuring that these elements can be quickly associated with the specific content to be found, resulting in efficient information acquisition.

PIRLS has the following specific requirements for this reading comprehension process: 1) identifying and retrieving information related to a specific reading target; 2) looking for details concepts; 3) trying to find definitions of words or phrases; 4) recognizing contextual details about a story (e.g., time and place); 5) searching for topic sentences or essential ideas (when explicitly specified); 6) and recognizing specific information in graphics (e.g., tables or maps).

3.2.2 Make Straightforward Inferences

When readers create indicating from text, they make inferences about concepts or details that are not clearly specified. They are able to make logical interpretations of ideas or information that are not directly articulated. This ability to comprehend prompts readers to go beyond the surface of the text and fill in gaps of information that may exist in the text. Sometimes the reasoning process involves a single detail in the text or requires bridging multiple related ideas, even though these connections may not be directly articulated, but still need to be constructed by the reader. The general meaning of the text remains clear and understandable despite the absence of explicit reasoning steps. This needs the viewers to promptly link 2 or more items of information to acknowledge a relationship. With this type of handling, the viewers is typically concerned not just with significance at words, phrase, or sentence degree, however with localized definitions located within a portion of the message.

PIRLS has the adhering to specific demands for this analysis comprehension process: 1) inferring that a person occasion resulted in another; 2) providing factors for a personality's actions; 3) explaining the relationship between both personalities; and 4) determining which part of the message is handy for a certain function.

3.2.3 Interpret and Integrate Ideas and Information

This analysis comprehension process viewers may focus on neighborhood or total definition or might link information to thematic ideas. Readers are making sense of the writer's intents and creating an extra complete understanding of the text in its entirety. When visitors are analyzing and incorporating, they are attempting to combine individual knowledge and experience with textual significance to create a much more specific or full understanding of the message. When viewers engage in this interpretive procedure, the links they make are not just implied, yet they make some interpretations based on their own perspectives.

PIRLS has the complying with particular demands for this reading comprehension process: 1) recognize the overall message or style of a message; 2) take into consideration alternate personality selections; 3) contrast and comparison textual info; 4) infer the state of mind or tone of a story; 5) discuss the potential for real-world application of textual information; and 6) contrast and contrast info presented within and throughout texts.

3.2.4 Evaluate and Critique Content and Textual Elements

When viewers analyze the content and elements of a text, the focus changes from constructing meaning to seriously taking into consideration the text itself. Text material or significance might be assessed or critiqued from a personal or objective point of view. This process may call for visitors to make reasoned judgments and linguistic expressions based upon their perspectives and to weigh their understanding of the message versus their understanding of the real world. Viewers might review the writer's language selections and methods of revealing significance and evaluate their competence. Furthermore, viewers can review the settings used to convey information-both aesthetic features and textual features-and translate their function (e.g., text boxes, photos, or tables). In evaluating the structure of a text, visitors base their analyses on a riches of previous analysis experience and a deep understanding of the features of different types of text. This capacity includes their efficiency in etymological kind and internal logic, which together create an effective framework for understanding and assessing text organization.

PIRLS has the following certain needs for this analysis comprehension process: 1) figure out the completeness or clearness of the information in a message; 2) evaluate the chance that the events described really occurred; 3) analyze the probability that an author's debate will certainly alter individuals' s ideas and habits; 4) establish the effect of the title of a message on the topic; 5) describe the result of linguistic features, such as allegories or articulation; 6) define the graphic elements of a message's effect; 7) establish the perspective or predisposition of a message or Web website; and 8) determine the writer's view of the main motif.

4. Exploration of Reading Teaching Strategies Under the Concept of PIRLS

The instructional methods chosen for this article come from Putting PIRLS to Use in Classrooms Across the Globe[], released by the main distribution of the International Association for the Evaluation of Educational Achievement (IEA), which contains the most recent scientific understandings from the PIRLS data, increasing on the excellent techniques of seven schools from the PIRLS getting involved nations and regions. The book intends to bridge the gap between science and method by assisting educators translate the most up to date clinical insights on reading literacy into instructional standards for all pupils to make use of in their everyday practice.

4.1 Giving Back to Students the Right to Ask Questions and to Export What They Have Learned

Teachers at Chesterton Primary School in the United Kingdom educated their students to analyze the text when they educated "Malfeasance" by asking them to first anticipate what the rhyme might be about based on the title alone. Students were after that asked to check out the text and describe its content. When they are not able to do this, it is an indication that they have not gotten to a complete understanding of the message. The teacher would then urge them to annotate the poem with their very own ideas and inquiries. When this is done, students are once again asked to discuss the poem and

address some questions about it. All students demonstrated a better understanding of the text as they had already learned the message noting technique. Some pupils were also able to recognize the moral of the rhyme. It appears that the teachers at Chesterton Primary School in the UK have likewise handed back to the students the right to outcome what they have actually discovered and have usually refined the students' capacity to interpret and integrate ideas and information, and to examine and evaluate material, language and message aspects.

We will find that the above schools are practicing the reading teaching strategy of returning the right to ask questions and output learning content to students. It centers on respecting the students' subjective position, considering them active participants in the process of knowledge construction rather than passive receivers. The initiative of questioning and learning content is returned to students, and students' learning autonomy is respected and stimulated. Students are no longer passive recipients of knowledge containers, but are able to explore and explore knowledge according to their own interests, needs and understanding; allowing them to set up learning paths according to their own interests, needs and abilities is also beneficial to personalized learning, and is more conducive to improving the efficiency and satisfaction of learning, as well as better meeting the learning goals and potential development of different students.

4.2 Teaching Reading Skills Clearly and Explicitly

Teachers at Chesterton Primary School in the UK focus on the explicit teaching of reading skills, and Chesterton Primary School specializes in 'class reading lessons'. In these lessons, teachers focus on teaching core reading strategies: comprehending text clearly, summarizing textual information, inferring textual information, and questioning and interrogating textual content. Each reading lesson has a "reading focus," which may be one of the core reading strategies or another related reading skill. Each lesson has five or six elements, usually in any order: predicting/inferring, comprehending, reading, questioning, and summarizing, as well as a written task that focuses on a specific reading skill developed in class. As students read each passage of text, the instructor asks them to consider three questions: a retrieval question, an inference question, and a question that requires them to bring their broader experience to the text. Students are also required to complete tasks that develop reading skills specific to the course. For example, this might be summarizing the text, predicting the next chapter, or creating an imagined future dialogue between characters, to name a few.

Having students regularly predict what might happen in a text (e.g., what will happen to a character during a storyline?), the practice ensures that students develop an internal reader's voice that allows them to think about their reading comprehension repeatedly and allows teachers to assess their own reading comprehension. Readers with strong reading comprehension constantly question what they read, and students develop their reading skills by considering the three types of questions posed in each reading lesson (i.e., a retrieval question, an inference question, and a question that requires them to bring their broader experience to the text). This helps them to deepen their understanding of the text and improve their reading comprehension skills.

It can be seen that Chesterton Primary School's clear and explicit teaching of reading skills to students avoids blind fumbling and ineffective efforts, and saves learning time and resources. At the same time, clear explanations also help to eliminate any confusion and misunderstanding that may arise during the learning process, establish a solid cognitive framework, and promote the internalization and application of knowledge. When reading becomes purposeful, strategic and interesting, the learning process is no longer a burden, but becomes an enjoyment and a way to explore the unknown world. This positive attitude towards learning is crucial to the development of lifelong learning and social adaptability.

4.3 Structured Treatment of Reading Instruction with Clear Steps

The Isaac Peral Primary School in Spain arranges lessons twice a week to systematically develop reading comprehension and writing skills. In reading comprehension, teachers always follow the same structure: Before Reading, During the Reading and After Reading phases and use different types of texts depending on the project they are working on with the students. The goal of what the teachers did was to make learning meaningful and connected to what was being done in the classroom. Teachers also planned different reading strategies to be practiced at each grade level. These strategies include making predictions or assumptions, making connections, asking themselves questions and later making inferences, and summarizing, consistent with the four levels of comprehension required by PIRLS.

In the instance of The Neverending Story, for instance, before reading, the instructor brings students right into the circumstance and makes a connection with them, "Today I will read you a wonderful story, but you'll have to close your eyes while you pay attention. What you need to do is imagine where the characters are, what they look like, and what the landscape looks like." The instructor after that models the images for the students and instructs them on exactly how to envision points as they read. "How can I imagine this woodland and trees...? If the glowing sphere is a fire, but there is a figure inside that is neither a guy nor a lady, how can I envision it...?" Educators inform pupils what they are considering aloud so they can ask themselves the exact same questions. Next off, with the help of the pupils in the classroom, the teacher illustrates on the board of what she is thinking of with the students.

During the reading, the educator sets several checking out jobs to help students total reading comprehension. Initially, motivate pupils to take part proactively: create sets to review the second excerpt, and you require to envision what the next scene will certainly resemble. Next off, ask students to ask each other concerns: you can talk with the students behind and in front of you to assist you broaden your vision of the scene and draw together what you see and think of from the reading. Re-establish the interactive connection with pupils: you will check out the next excerpt and complete it with each other or in sets as we did before, and currently independently. If there are any type of words in the text that you don't comprehend, we can discuss them together to make them less complicated to understand. Let go and your drawing will certainly be fantastic. You need to think that no one will certainly do a bad job since what is important here is your creativity, how you envision what you read.

And as they read, students can write down everything that will help them understand word meanings, contextual expressions, plot descriptions, etc., and they can feel free to ask questions if they have any questions about the text. The teacher will give everyone a piece of paper so that students can begin to sketch out what they see and construct scenes.

After reading, when the students have completed drawing their fictional developments, the students will certainly show them to every person in the class. Together, the educator will discuss the distinctions between the others' drawings and their own. Each student will certainly clarify what technique they used when offering their illustration. Exactly how they envisioned it and what in the message helped to draw it in this way. It is very important in this session that everybody clarifies what they pictured and exactly how they attracted it.

Organizing the teaching process in a structured way can effectively avoid blindness and randomness in the teaching process of teachers and ensure that each step of teaching has a clear purpose and role, thus improving the overall efficiency of teaching. Structured teaching design helps build a coherent knowledge framework, enabling students to form a systematic cognitive structure in the learning process. This way not only helps students to better understand individual texts, but also promotes the integration and application of cross-text knowledge, thereby enhancing learning.

4.4 Enrichment of Reading Lessons to Stimulate Interest in Reading

In order to make the knowing procedure enjoyable for students, lessons should be enriched through fascinating and interactive ways. The extra varied and varied the curriculum is, the even more interest and duty students will certainly receive their research studies. In this regard, increasing student inspiration relies on the educator. Educators at Akhalkaki Public School No. 2 in Georgia utilize a "play and do" approach to stimulate students' rate of interest in reading. When planning lessons and tasks, teachers take into consideration pupils' abilities, interests and the reality that each student needs a differentiated strategy. Consequently, instructors attempt to produce an environment in which all students take part just as in the learning process. For far better outcomes, both instructors and students need to be geared up with a selection of resources that can be made use of effectively and effectively in the teaching and learning process. Bringing books to life with significant or display adaptations of messages is an integral part of being a great reader. The use of role-playing in the training and learning procedure is no longer brand-new. This approach first and foremost helps to improve thoughtful reading abilities and increase motivation to read. Educators and moms and dads ought to identify that analysis is enjoyable, not a monotonous need. Educators need to motivate students to check out by recommending ideal messages, arranging casual events for literary scholastic evenings, and various types of support to make students good visitors. Constant check outs from parents, fascinating individuals visits, publication discussions with pupils, efficiencies, debates, and providing students boosted analysis abilities when they compensates to enhance motivation.

Teachers as role models are critical to motivating students to read. They see teachers reading, teachers discussing favorite books and books they are reading, and discussing those books with them.

Activities to motivate students to read also need to be suggested: reading forums, storytelling in the classroom library, creating spaces for students to recommend books to each other, or having family members read with younger students. If students are motivated to read, they will be more likely to understand what they are reading. Not only will they decode the meaning of the letters, but they will become part of the story they are reading.

Below is an example of a reading lesson for this school, Penguin Pepe:

BEFORE READING: To motivate pupils and introduce the lesson topic, the instructor showed pupils a passage from an animation about penguins. The teacher then asked the following concerns, "What is this flick concerning? Do you find out about it?" and asked to explain why the flick was revealed and what the lesson would talk about. The educator revealed pupils the understanding material, a publication about Pepe the Penguin. The instructor reflects with the pupils on the image on the cover of the book and tells them that they will read and talking about a post about penguins. This demonstrated that pupils were enabled to evaluate the material of the text and reviewed the importance of the title to the text. The instructor after that presents students to the topic and objective of the lesson and supplies info about the analysis methods they have to utilize throughout the lesson. Clear goals were set here to provide students a clear idea of what they would certainly be discovering following, and anime clips were revealed to promote their interest in analysis.

DURING READING: The function of Stage 2 analysis is to outfit students with brand-new expertise and abilities by proactively working with the text. The teacher begins reviewing the message by reading the first component out loud. students after that checked out the text by applying different analysis techniques, consisting of continual analysis, directed analysis, and time out reading. By using various techniques during reading-thinking out loud, asking inquiries, and making assumptions-to ensure that students understand the message they read, in the PIRLS Reading Comprehension Competency Framework, each of the above reading methods mobilizes students' capacity to take note and to capability to draw out plainly mentioned info, and the capacity to make direct inferences. After the reading, the instructor paid attention to an audio recording of the same text with, which grew the pupils' memory and allowed them to further justify the information and occasions given up the text. After that, the text was gone back to once more and pupils were assisted through concerns to much better understand the message. Right here the students' capability to translate and integrate ideas and info is enabled to establish. Students better discovered the information of the message and were asked to fill out a table regarding the attributes of 3 animals that showed up in the story. This procedure shows that the teacher uses a selection of analysis methods to inspire students to participate in reading and to grow their understanding of the textual info in each analysis job.

AFTER READING: The goal of Stage 3 is to guide students to utilize their understanding and skills to discuss essential issues, summarize, answer questions, or make fascinating and innovative items. After reading and refining the message, the teacher asked the students to assist the penguins to complete the sentence "The elephant is...", and after that drew appropriate images for them.

POST-LESSON EVALUATION: At the end of the lesson, pupils assessed the lesson by checking out and discussing which activities they appreciated the most, whether they were energetic, whether they fulfilled their assumptions, what they thought about the message, and which subjects they would love to learn more regarding in the future. Below the students' ability to take a look at and examine content, language and textual elements is set in motion, not just to check whether the students are completely inspired in the analysis procedure, yet additionally to allow for reflection on teaching and learning based on the students' examinations.

As can be seen from the example of the lesson, a variety of content choices can meet the needs of different students. The combination of cartoon clips and reading materials chosen by the teacher can attract students with different interests and preferences, thus stimulating their enthusiasm for reading; a variety of interactive teaching methods increase the interest and participation in learning; setting reading goals and accomplishing them with students can increase students' motivation to read, which strengthens their sense of achievement. Therefore, enriching the design of the reading program not only helps to improve students' reading skills, but more critically, it stimulates and sustains students' enduring interest in reading by creating a multidimensional and multilevel reading experience.

4.5 Teaching Students to Enjoy and Read Deeply

Teachers at Chesterton Primary School in the UK believe that when pupils leave school they should be able to choose and read a wide range of materials confidently and enjoy reading. The everyday analysis program at Chesterton Primary School allows time for youngsters to take part in publication discussions, consisting of assessing the author's use of language and just how this influences the reader, thus training students to take a look at and evaluate content, language, and text aspects. Teachers urge students to see themselves as discerning readers and to confidently discuss whether they appreciated a message and just how much they agreed with it. It is important to provide a daily space-it could be a casual lesson or a casual discussion-where the teacher models reading comprehension and ensures that children enjoy reading before analyzing the content together. The questions the teacher asks the children are carefully planned and thought through, and this space for talking about books and everyday discussions means that the children really delve into a book, and the teacher can assess each child's level of comprehension, which can then be factored into the planning of the next lesson.

Teachers in Georgia's Vill Darbazi Public School will appropriately choose training methods that are equivalent, respectful of students, and that listen to and endure differing opinions, creating considerate communications between pupils and teachers while increasing inspiration to learn. As a result, students stop focusing on summative assessments and instead focus on formative assessments and become allies in learning. Students become motivated and want to learn, resulting in enjoyment of reading and deeper reading.

Deep reading enhances students' critical thinking and problem-solving skills. When students delve into a topic, they need to analyze and synthesize information and construct their own insights, which aligns with the four levels of reading comprehension promoted by PIRLS. In addition, deep reading

enhances memory and concentration, as understanding complex concepts often requires a high level of concentration and repeated reading. Further, reading can be used as a stress-reducing tool to help students find peace and enjoyment in the midst of a stressful academic life. A good book can provide a portal to escape reality and explore the unknown, which is especially important for students' mental health. Through reading, students also develop patience and self-drive, qualities that are essential for lifelong learning.

Under the guidance of the PIRLS concept, the right to ask questions and output learning content is given to students, aiming to develop their critical thinking, independent learning ability and creativity. By encouraging students to take the initiative to ask questions, teachers not only stimulate students' curiosity, but also motivate them to actively participate in the learning process. Secondly, the structured treatment of reading teaching is an important means of ensuring learning effectiveness. Teachers' careful planning of course content and structured lesson plans help students establish good reading habits, while providing systematic guidance so that students can gradually master reading strategies and methods. Ultimately, the goal of education is to enable students to become subjects of their own love of learning and deeper inquiry into knowledge. Through the above strategies, students not only learn the basic reading skills, but more importantly, they learn how to enjoy the reading process and derive pleasure and satisfaction from reading.

5. Conclusion

In summary, the exploration of teaching strategies under the PIRLS concept aims to build a student-centered learning environment that emphasizes independent learning and in-depth inquiry. By returning the right to ask questions to students, structuring the handling of reading instruction, and encouraging students to enjoy and delve into reading, teachers can effectively contribute to the holistic development of students and improve learning efficiency and academic performance.

Author Contributions

The author confirms full responsibility for the following matters: research conceptualization and design, data collection, result analysis and interpretation, and manuscript preparation.

Availability of Data and Materials

The data on which the study is based were accessed from a repository and are available for downloading through the following link. https://timss.bc.edu

Conflicts of Interest

The author declares no conflicts of interest to report regarding the present study.

References

[1]. Mullis, I. V. S., & Martin, M. O. [Eds]. *PIRLS 2021 Assessment Frameworks*, 2019.

[2]. Khoudi Z, Nachaoui M, Lyaqini S. Identifying the contextual factors related to the reading performance of Moroccan fourth-grade students from a Machine Learning-based Approach[J]. *Education and Information Technologies*, 2023: 1-27.

[3]. Marôco J. What makes a good reader? Worldwide insights from PIRLS 2016[J]. *Reading and Writing*, 2021, 34(1): 231-272.

[4]. Shiel G, Eivers E. International comparisons of reading literacy: What can they tell us? [J]. *Cambridge journal of education*, 2009, 39(3): 345-360.

[5]. Lopes J, Oliveira C, Costa P. School and student determinants of reading performance: a multilevel analysis with Portuguese students[J]. *Revista de Psicodidáctica (English ed.)*, 2022, 27(1): 29-37.

[6]. Johansson S, Myrberg E. Teacher specialization and student perceived instructional quality: what are the relationships to student reading achievement? [J]. *Educational Assessment, Evaluation and Accountability*, 2019, 31(2): 177-200.

[7]. Basarkod G, Marsh H W, Guo J, et al. The happy-fish-little-pond effect on enjoyment: generalizability across multiple domains and countries[J]. *Learning and Instruction*, 2023, 85: 101733.

[8]. Mullis, I. V. S., & Martin, M. O. [Eds]. *PIRLS 2021 Assessment Frameworks*, 2019.

[9]. Bruggink M, Swart N. Putting PIRLS to Use in Classrooms Across the Globe[M]. *Switzerland: Springer*, 2022.