

Analyzing Reading Education Reforms in Chinese Schools Using an Ecosystem Model: Insights from China's 2018 PISA Reading Test

Yameng Qian^{1,a,*}

*¹Department of Marketing, Yunnan Normal University, 1 Yuhua Area, Chenggong District,
Kunming, Yunnan, 650500, China
a. 1811581201@mail.sit.edu.cn*

**corresponding author*

Abstract: This paper explores the imperative of enhancing reading proficiency among Chinese students, particularly for studying abroad. Drawing on the 2018 PISA test, it comprehensively analyzes macro and micro factors in the educational ecosystem. It aims to optimize reading literacy education in China using the PISA and Chinese regional tests. It provides recommendations at systemic and individual learner levels. At the macro level, the study examines national policies, cultural values, and the need for a comprehensive policy framework. Adequate resources, evidence-based practices, and a reading culture are advocated. A comprehensive national policy framework, resource allocation, evidence-based practices, and a reading culture are crucial. At the micro level, the significance of individual factors, curriculum design, and parental involvement are emphasized. An effective curriculum, critical literacy skills, and parental support are essential. In conclusion, this paper acknowledges the need to enhance reading skills among Chinese students studying abroad. By examining macro and micro factors, it offers practical recommendations to optimize reading literacy education. This multifaceted approach considers national policies, cultural values, curriculum design, and parental engagement. By addressing these aspects, China can equip its students with the necessary reading skills to thrive in a globalized world.

Keywords: PISA test, ecosystem model, China's reading test, reading education

1. Introduction

As a major international student country, China has long sent a large source of international students. 2019 saw a total of 106,511 students from China studying at overseas higher education institutions, firmly the highest number in the world [1]. The National Report on Study Abroad 2021, released at the China International Education Summit 2021, shows that among students who are willing to study abroad, more than 90% adhere to their plans to study abroad, and the most common measure in the face of the epidemic is to delay rather than abandon their study plans, and the student body remains strong in its willingness to study abroad [1]. For many international students reading literature, understanding it and being able to produce high quality essays is a challenge that has always plagued many international students. Therefore, it is important to study how to develop Chinese students' reading comprehension skills for different languages and media.

Programme for International Student Assessment (PISA), a global study, assesses the education system by measuring the performance of 15-year-olds in reading, mathematics and science. With reading as the main item in the PISA test, the analysis of PISA reading scores is general and adaptive especially regarding how international students adapt to international reading patterns and how local Chinese reading education is aligned with international standards. It is an important guide.

The aim of this paper is to use an ecosystem model based on Chinese students' 2018 PISA reading test results, with the aim of analyzing Chinese students' ability to excel in reading in terms of parental involvement and personal factors as well as curricular aspects in the microsystem and policy regulations and national sentiments in the macrosystem. The paper analyses the intricate factors that influence reading education in China, and in doing so, makes recommendations for the reform of reading education in China and the direction of progress for parents, schools and individuals.

2. Literature Review

This literature review aims to synthesize the existing research on the factors contributing to China's high performance in the 2018 PISA reading tests, with emphasis on the interplay between macro-policy and micro-individual aspects. The review will focus on four primary areas: national policy, cultural values, individual factors and curriculum, and parental involvement.

2.1. National Policy

He Qingqing highlights the pivotal role of government policy decisions in promoting the development of reading literacy in Shanghai, a pioneering pilot base for reform [2]. Since 1988, Shanghai has established local curriculum and materials reform committees for primary and secondary school students to carry out targeted reforms, contributing to the progress in reading literacy since the implementation of curriculum reform in 2001. However, Sheng Yu, Wei Saiya, and Li Xin point out that the current Chinese education policy on reading does not explicitly address digital reading, which may affect future performance on PISA tests that increasingly emphasize electronic reading [3].

2.2. Cultural Values

He Qingqing also emphasizes the importance of national emotional values in shaping Chinese students' performance. Chinese culture has traditionally valued education, with the aspiration of the lower classes to pass exams and enter university to change their social status. This has created a unique student body that is highly enthusiastic about exams and devotes significant time to preparation [2].

2.3. Individual Factors and Curriculum

Regarding micro influences, Naumann suggests that students' familiarity with e-reading and the use of scientific methods significantly affect reading performance [4]. To improve reading education, increasing Chinese students' exposure to e-reading and related technologies is vital. Additionally, Zhao Ningning et al. emphasize the importance of metacognition in students' reading literacy performance, with factors such as interest in reading, comprehension and memory, and summarizing and evaluating metacognitive strategies significantly impacting performance. They also stress the need for schools to set up targeted programs to enhance students' text comprehension, information capture, and critical thinking skills [5].

2.4. Parental Involvement

Finally, Zhao et al. highlight the crucial role of parents in students' reading literacy performance [5]. Family factors, such as socio-economic status, perceived parental emotional support, and parental language, are more influential in countries/regions where reading literacy performance is weaker. Therefore, parental involvement and education are essential components of a comprehensive reading literacy strategy.

Overall, China's high performance in the 2018 PISA reading tests can be attributed to a combination of factors, including national policy, cultural values, individual factors and curriculum, and parental involvement. However, there is a gap in research regarding recent educational reforms, such as the implementation of the New Curriculum Reform program and the 'double reduction' policy. Future studies should explore the implications of these reforms on reading education in China and how schools, parents, and students can further improve reading education scientifically and effectively at the micro level.

3. Presentation of PISA Reading Results

This section outlines the research approach, philosophical stance, and data sources used to investigate the factors impacting Chinese students' reading achievement in the PISA 2018 test. The interpretive qualitative analysis method is employed, and the ecological systems theory provides a framework for examining the macro and micro factors affecting students' reading performance.

To analyze the data, a qualitative research approach is adopted, involving a comprehensive examination of specific factors influencing students' reading achievement. The primary data source for this study is the Organization for Economic Co-operation and Development (OECD) website, which provides PISA test results for Chinese students in 2018 [6]. The data from the OECD is rich in detail, and it provides a reliable and comprehensive dataset that can be used to gain insights into Chinese students' reading performance.

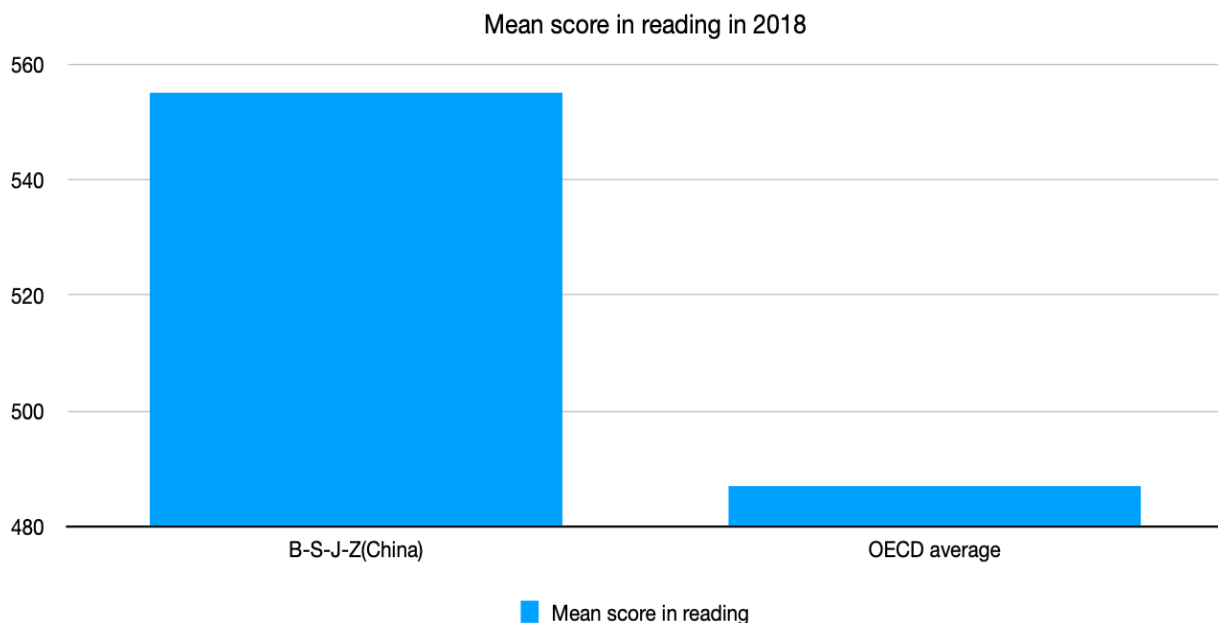


Figure 1: Mean score in reading in 2018 [6].

As Figure 1 shows that Chinese students' reading scores consistently surpass the OECD average test scores, albeit with a slight decrease in 2018 compared to 2015. In B-S-J-Z (China), 95% of students achieved a minimum Level 2 reading proficiency, significantly outperforming the OECD

average (OECD average: 77%). Approximately 22% of students in B-S-J-Z (China) demonstrated exceptional reading skills, attaining Level 5 or 6 on the PISA reading test (OECD average: 9%). These findings indicate that Chinese students' reading abilities surpass those of students from the majority of countries participating in the Programme for International Student Assessment (PISA) test.

Table 1: PISA2018 Reading Literacy Framework [7].

| Year Latitude | Situation | Strategies | | |
|---------------|---|---|--|---|
| 2018 | Personal, public, professional, educational | Information location | Text comprehension | Evaluation and Reflection |
| | | Accessing and retrieving text information Searching and selecting relevant texts | Develop a holistic understanding of text integration and interpretation, inference | Evaluation quality and credibility Reflecting on content and form Discovering and dealing with conflict |

Table 2: PISA2018 Reading Literacy Framework [7].

| Year Latitude | Situation | Strategies | | | |
|---------------|---|-------------------------|---|---|--------------------------|
| 2018 | Personal, public, professional, educational | Unit | Type | Form | Structure and navigation |
| | | Single text, multi-text | Discuss, describe, illustrate, narrate, instruct, communicate, interact | Continuous text, discontinuous text, mixed text | Static and dynamic text |

Referring to Table 1 and Table 2, the 2018 PISA reading test introduced a contemporary e-reading format, augmenting the traditional textual format and rhetorical style. This innovative approach transcends the confines of conventional testing by encompassing a broader range of organizational structures and information sources. Consequently, the reading test takes on a hypertextual and non-linear trajectory, enriching the depth and diversity of the reading material. Concurrently, the cognitive process dimension incorporates elements of task management, emphasizing the aim to heighten the reader's subjective engagement with the text. This dimension underscores the significance of the reader's own learning regulation strategies, which profoundly shape the reading experience.

In essence, this groundbreaking approach expands both the text dimension and cognitive processes of the reading test. The text dimension now embraces diverse formats and sources, surpassing traditional boundaries to encompass organizational structures and hypertextual elements. This expansion enriches the reading material, offering readers a more diverse and dynamic experience. Simultaneously, the cognitive process dimension integrates task management elements, acknowledging the reader's agency and emphasizing the importance of personal learning strategies. Consequently, this approach encourages readers to adopt a more active and independent role in their reading journey [8].

It is worth noting that this shift to e-reading may have contributed to a slight decrease in Chinese students' scores, as they were less accustomed to this format. The majority of Chinese students still rely on traditional paper-based books and reference materials, which may explain the marginal decline in the 2018 reading scores compared to 2015.

However, it is important to acknowledge the limitations of the qualitative approach, including potential biases stemming from confidentiality and voluntary participation. Additionally, the absence of regression analysis for the collected data hinders a precise determination of relationships and the extent of influence among different factors.

In summary, this study employs a qualitative research approach to examine the factors impacting Chinese students' reading achievement in the 2018 PISA test. The comprehensive dataset from the OECD and the ecological systems theory as the analytical framework contribute to a thorough analysis. Acknowledging the limitations of the qualitative approach, the subsequent analysis will focus on the OECD data to establish a reasoned causal analysis of China's 2018 PISA reading data.

4. Theoretical Analysis - Using Ecosystem Model for Analysis

4.1. The Macro System

The macro system includes education policies and regulations set by the government, as well as cultural beliefs and attitudes towards education that shape the education system. These factors significantly impact students' reading achievement by influencing the resources and support available for reading education. In particular, cultural beliefs and attitudes towards reading play a critical role in determining the value placed on reading and the extent to which students prioritize and develop strong reading skills.

It is important to note that PISA is considered the most comprehensive and reliable indicator of student achievement globally, and a powerful tool for countries and economies to fine-tune their education policies. Therefore, the reading scores demonstrated by Chinese students in the 2018 (PISA test are influenced by a number of policy and value perspectives from the macro system.

To better understand the impact of these factors, this study will examine the education policies and regulations set by the Chinese government, as well as the cultural beliefs and attitudes towards reading in Chinese society. By analyzing these factors, the study aims to provide insights into how the macro system influences Chinese students' reading achievement in the PISA test.

4.1.1. Influence of Policy

Since the first phase of curriculum reform in 1988, the language curriculum in Shanghai has focused on developing reading skills and the concept of reading as the basis for improving students' overall language skills [2].

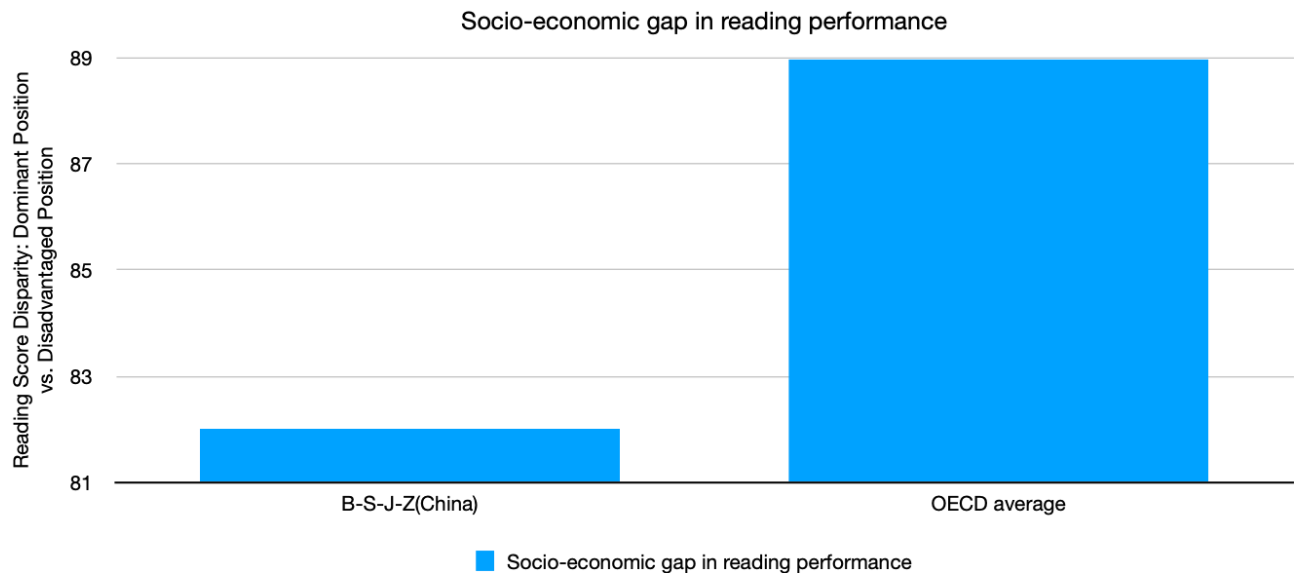


Figure 2: Socio-economic gap in reading performance [6].

As a leading city in China's educational reform, Shanghai has continuously implemented positive measures to keep pace with changing times, despite some initial resistance to experimental reforms. This has resulted in significant qualitative improvements in the education system. Furthermore, Shanghai has long been aware of the impact of socio-economic differences on student performance.

As Figure 2 shows that in the 2018 (PISA test, students in B-S-J-Z (China) who were socio-economically advantaged scored 82 points higher in reading than those who were disadvantaged, which is similar to the OECD average of 89 points. This reflects the effectiveness of policies and support for students in socially disadvantaged situations. In recent years, China has established several support policies specifically for disadvantaged students. From the pre-school level to the end of compulsory education (9 years), tuition fees and textbooks are waived. State-subsidized scholarships are available from high school to higher education levels to create a positive learning environment for socially disadvantaged students. A system of financial transfers to schools and vocational structures serving disadvantaged students has also been established to incentivize outstanding teachers to teach in such schools.

At the same time, the "double reduction policy," which emphasizes the importance of comprehensive quality education, has been in place for several years. Reading is a crucial aspect of developing quality education, and the introduction of these policies has raised the importance of reading among students. As a result, students have consistently placed a higher priority on reading, and these policies provide a scientific approach to developing their reading skills. The emphasis on achieving equity in education has also increased, and the impact of socio-economic disparities on academic achievement has been mitigated by the imposition of the 'double reduction policy.' These are the policy reasons that have contributed to the ability of Chinese students to achieve good results in reading literacy. However, there are still many uncontrollable aspects that need to be addressed.

4.1.2. Recommendations for Policy

The current state of education policy reform in China is the result of a comprehensive assessment of the current situation, relevant literature, and the OECD data. While China’s education policy has made strides in promoting equity in basic education, the pressure to excel in academics has created a high-pressure learning environment that may compromise the effectiveness of the policy.

Therefore, it is essential to ensure that education policies are implemented in a way that balances academic pressure with students’ well-being.

Moreover, the persistent socio-economic divide in China highlights the need for policies that address broader social inequalities. Education policies alone cannot close the gap between the rich and the poor. Hence, policymakers must consider the wider societal implications of education policies to maximize their impact.

Therefore, it is necessary to strengthen education policies with appropriate social policies that promote equality and fairness in all aspects of society. This holistic approach will ensure that education policies are sustainable and contribute to China’s overall development.

4.1.3. National Values Perspective

In spite of the deep-rooted value assigned to education in Chinese society, the prioritization of reading education has not always been evident. However, there has been a notable shift in cultural attitudes towards reading education, recognizing the need for improvement in students’ reading achievements. In recent years, a series of initiatives, including the Opinions on Promoting Reading for All, have been introduced, underscoring the significance of reading as a means to acquire knowledge, nurture wisdom, preserve cultural heritage, and enhance the nation’s overall quality.

Table 3: Adult Reading Rates in China (2019 vs 2020) [9].

| Category | 2019 | 2020 | change |
|------------------|-------|-------|--------|
| Books | 59.3% | 59.5% | 0.2% |
| Newspapers | 27.6% | 25.5% | -2.1% |
| Periodicals | 19.3% | 18.7% | -0.6% |
| Digital Reading | 79.3% | 79.4% | 0.1% |
| Combined Reading | 81.1% | 81.3% | 0.2% |

Examining the data presented in Table 3 reveals an encouraging trend in reading engagement among adult nationals in China. The combined reading rate across all media, encompassing books, newspapers, and digital publications, stood at 81.3% in 2020, marking a slight increase of 0.2 percentage points from the previous year’s 81.1%. Notably, the book reading rate among adults reached 59.5% in 2020, showing a marginal growth of 0.2 percentage points from 59.3% in 2019. Conversely, the newspaper reading rate experienced a decline of 2.1 percentage points, dropping from 27.6% in 2019 to 25.5% in 2020. Similarly, the reading rate of periodicals saw a modest decrease of 0.6 percentage points, reaching 18.7% in 2020 compared to 19.3% in 2019. On the other hand, the exposure rate of digital reading methods, such as online reading, mobile phone reading, e-reader reading, and Pad reading, witnessed a slight rise of 0.1 percentage points, reaching 79.4%. These data highlight the substantial progress made in promoting reading development, thanks to dedicated policy efforts.

The endeavor to promote reading for all and foster a reading culture is widely recognized as a necessity in China's new era. The introduction of pertinent guidelines, combined with the emphasis placed by the Chinese people on cultural heritage and knowledge accumulation, has successfully nurtured an active reading culture. This cultural transformation has significantly influenced students, inspiring them to actively engage in reading. Consequently, reading education has experienced rapid development at both the societal and cultural awareness levels, bringing forth positive outcomes for individuals and society as a whole.

4.1.4. Recommendations for National Values

In recent years, China has made significant progress in promoting a national culture of reading, with the introduction of initiatives such as the Opinions on Promoting Reading for All and the establishment of community libraries. However, as reading methods shift from paper-based to electronic reading, there is a need to adapt and improve reading education. The proliferation of electronic reading materials has created new challenges, particularly in identifying and analyzing information effectively.

In addition, there is a need to encourage people to read more electronically and to develop critical thinking skills to evaluate the authenticity and credibility of electronic information. This can be achieved through public campaigns and the promotion of media literacy.

Overall, the development of a culture of reading in China should not be limited to traditional paper-based reading materials. Instead, efforts should be made to adapt to new forms of reading and promote electronic reading, while also developing critical thinking and media literacy skills.

4.2. Microsystem

The microsystem is comprised of individual factors, the curriculum, and parental involvement, all of which significantly impact students' reading achievement. A strong correlation has been found between reading literacy performance and students' interest in reading. The number of reading lessons offered in school directly affects the time students spend engaging in reading activities, making the curriculum a crucial component of reading education. Moreover, the dominant role of Chinese parents in the family ecosystem heavily influences students' reading performance, highlighting the importance of effectively engaging parents in reading education activities.

4.2.1. Influence of Parental Attitudes

The survey results indicate that weaker reading literacy performance is associated with greater reliance on parental emotional support and exposure to language influences from both parents, often resulting from excessive parental involvement in their children's education.

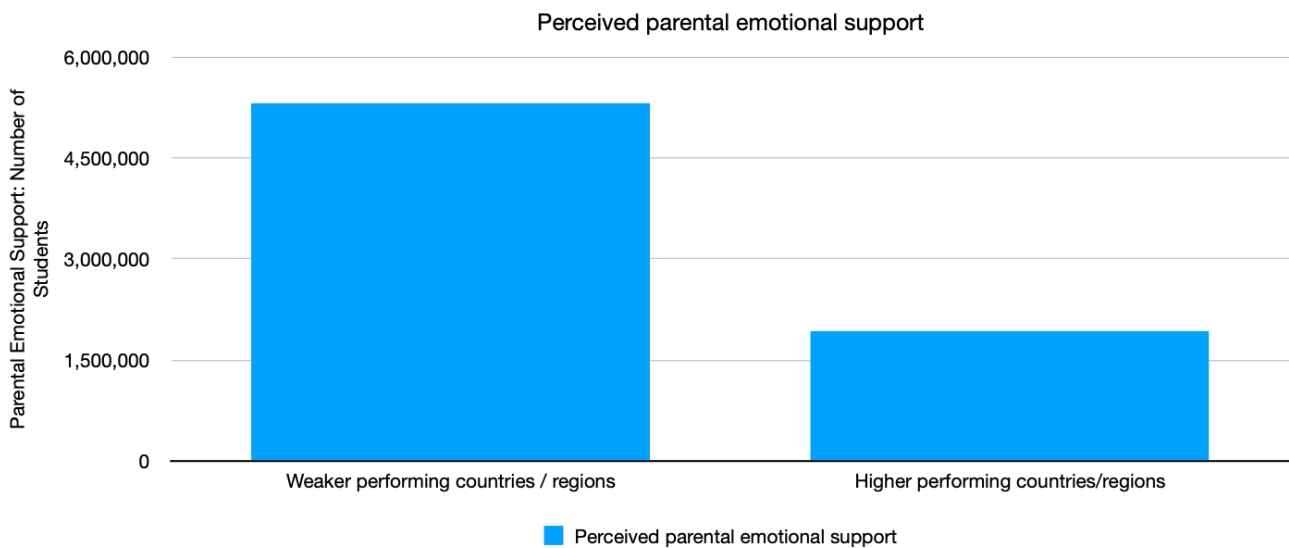


Figure 3: Perceived parental emotional support [6].

Chinese family education is deeply rooted in Confucianism, and with the rising number of only children in China, parents tend to dominate nuclear families, making it challenging to reduce excessive parental interference in children's learning. Students' reading performance is affected by varying parental education levels and differing degrees of understanding and attention to reading.

However, as the data in Figure 3 shows, exceptional reading literacy performance in the B-S-Z-H (China) region can be attributed to highly educated parents who adopt a more scientific approach to their children's learning. These parents understand and cooperate with the school's educational model, which minimizes the negative impact on students' reading literacy.

4.2.2. Reflections and Suggestions for Parental Involvement

Parents should create a reading-friendly environment at home and actively engage in discussions about reading materials with their children. Through critical conversations, parents can help expand their children's understanding of various reading materials and encourage them to analyze and express their opinions. Positive reinforcement of reading achievements motivates students to continue reading and maintain effective comprehension and critical thinking skills. While implementing these suggestions might be challenging, improving the home reading environment is a change that every parent can strive for.

4.2.3. Personal Factors and Curriculum

Metacognitive development is crucial for students, and reading literacy performance is influenced by individual factors, such as reading interest, comprehension ability, memory, and metacognitive strategies such as summarizing and evaluation. Digital reading demands efficient information extraction and places a greater emphasis on purposeful reading activities. With 93.1% internet penetration among minors in China, and 89.6% using the internet for learning, digital reading is becoming increasingly popular [5]. Although Chinese students have continued to perform well in PISA tests, adapting to new reading methods is essential.

The curriculum plays a critical role in reading literacy performance, and the allocation of reading time and the incorporation of critical thinking training directly impact students' reading literacy. In rapidly developing regions such as Beijing, Shanghai, Jiangsu, and Zhejiang, curriculum reform

policies and innovative programs have facilitated reading literacy improvement. However, in the realm of contemporary language reading teaching, there has been a tendency to overly prioritize the humanistic dimensions of reading, primarily focusing on analysis and appreciation within the realm of language ontology. Unfortunately, this emphasis has somewhat neglected the practical aspects of reading and deviated from the core purpose of reading, which encompasses broader applications in various facets of life [10]. As a result, there exists significant scope for improvement within the curriculum to address this imbalance.

4.2.4. Reflections and Suggestions on Personal Factors and Curriculum

The current exam-oriented nature of the Chinese curriculum hampers students' reading and cognitive abilities, necessitating a prioritization of reading education in schools. By focusing on vocabulary, comprehension, and critical thinking, schools can foster students' reading proficiency. It is vital to provide diverse reading opportunities, including electronic texts and non-fiction materials, and introduce various reading forms like digital reading skills.

While the present approach to language reading instruction aims to deepen understanding and appreciation of literature and language, it may inadvertently neglect the practical application of reading skills. Reading extends beyond literary analysis and linguistic exploration; it empowers individuals to navigate and engage with the world, acquiring knowledge and making informed decisions.

To bridge this gap, the curriculum must be revised to adopt a comprehensive and holistic approach to reading education. This involves integrating practical components that equip students with the skills and strategies necessary to comprehend and apply information from diverse sources. By expanding the focus beyond textual analysis and establishing a connection between reading and real-life contexts, students can develop a versatile reading repertoire.

By reframing the curriculum to strike a balance between the humanistic and practical dimensions of reading, educators can cultivate a well-rounded reading experience. This approach acknowledges the value of literary analysis and appreciation while recognizing the importance of equipping learners with the tools to thrive in various contexts.

To ensure targeted development of students' text comprehension and reading skills, schools should tailor metacognitive strategies and critical thinking skills to each student's unique characteristics. This personalized approach is crucial for adapting to the evolving demands of reading literacy.

5. Conclusion

The ecosystem model provides a comprehensive approach to examine the direction of reading curriculum reform in the Chinese education system. In order to enhance students' reading literacy, reforms in reading education should focus on promoting reading interests and habits, as well as improving the comprehensiveness of reading education. Additionally, it is important to ensure equitable distribution of educational resources to advance students' reading abilities and promote educational equity.

However, it is important to note that the findings of this study may not be generalizable to all provinces and municipalities, as PISA tests in China are mainly administered in more developed regions. As such, it is recommended that further comparative analysis be conducted using data from other less developed countries or regions to provide a more comprehensive understanding of the issue.

Moreover, it is important to recognize that a successful reading curriculum should not solely rely on academic achievement but also on the holistic development of students. Teachers should take into account students' individual needs and interests when designing the reading curriculum. By

integrating various genres and forms of reading materials, such as fiction, non-fiction, poetry, and digital media, students can develop diverse reading abilities and foster a lifelong love of reading.

Additionally, policymakers and educators should also recognize the importance of parental involvement in students' reading education. Parents can play a critical role in fostering reading habits and interests, and schools should encourage and support parental involvement in reading activities.

In conclusion, the ecosystem model offers a comprehensive perspective for examining reading curriculum reform in Chinese education. By promoting reading interests and habits, improving the comprehensiveness of reading education, and ensuring equitable distribution of educational resources, we can advance students' reading abilities and promote educational equity. It is important to conduct further comparative analysis and recognize the importance of holistic development and parental involvement in reading education.

References

- [1] Zheng, N. (2022). *Blue book on the development of study abroad in China (2022) published and released. Study Abroad*, 20, 68-73.
- [2] He, Q. (2021). *The future of curriculum reform in basic education based on the PISA test: The Shanghai PISA test as an example. Anhui Educational Research*, 24, 1-4.
- [3] Sheng, Y., Wei, S., & Li, X. (2023). *PISA2018 digital reading assessment framework and insights. Journal of Jilin Provincial College of Education*, 01, 154-158.
- [4] Naumann, J. (2015). *A model of online reading engagement: linking engagement, navigation, and performance in digital reading. Computers in Human Behavior*, 53, 263-277.
- [5] Zhao, N. N., Li, P., Zhong, K. L., Li, G., & Wen, H. B. (2022). *An international comparative study of PISA2018 students' reading literacy and its influencing factors. Research on Children and Adolescents*, 12, 41-55.
- [6] OECD. (2019). *PISA 2018 results (Volume 1): what students know and can do. OECD Publishing*. 10.1787/5f07c754-en
- [7] OECD. (2016, October 8). *PISA 2018 Draft Analytical Frameworks [EB/OL]*. Retrieved from <https://www.oecd.org/pisa/pisaproducts/PISA-2018-draft-frameworks/>
- [8] Zou, Y. (2020). *From 2009 to 2018: What the PISA reading test has brought to language education--and a review of the language curriculum reform in Shanghai. Language Learning*, (04), 4-9.
- [9] *Results of the 18th National Reading Survey released [EB/OL]*. (2021, April 25). Retrieved from <https://www.nppa.gov.cn/nppa/contents/280/75981.shtml>
- [10] Li, Z., & Jin-Li. (2022). *PISA 2018 reading literacy test framework and sample questions oriented analysis. Educational Guide*, (08), 76-81.