Comparative Study On Diverse Media Based Tools For Assessing English Reading Proficiency

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ARTICLEINFO	ABSTRACT
	— As society continues to evolve, the field of education has undergone a major transformation, with the advent of online education revolutionizing every facet of the educational landscape. Evaluation methods for English reading, which play a crucial role in the English language acquisition process, are constantly being updated and revised. In this study, the authors conducted a comprehensive questionnaire survey and semi-structured interviews with 200 first-year students to statistically analyze and sample two primary assessment tools for English reading. The objective of this paper is to conduct a comparative investigation on paper-based assessment (IELTS Reading test) and online assessment (Star reading test) from multiple perspectives including assessment focus, feedback content, follow-up teaching guidance, and student evaluation. The results of this study will not only assist teachers and students in developing appropriate plans for future teaching and learning endeavors, but also enhance the effectiveness of English reading classes. By effectively integrating assessment results, teacher-student assessments, and establishing a dynamic and all-encompassing assessment system, it is anticipated that the efficiency of English reading instruction can be significantly enhanced. **Index Terms**—Teaching; English reading; paper-based assessment; online assessment

I. INTRODUCTION

Since the 1960s, there have been two distinct perspectives regarding the definition of reading proficiency in English language instruction. Lunzer & Gardner posited that reading is a holistic process influenced by factors such as purpose, reader proficiency level, and situational context. However, Rosenshine (1980) revealed that sub-abilities identified through factor analysis were not easily unified, thus lacking sufficient evidence to support the notion of multidimensionality in reading comprehension ability. On the other hand, Rumelhartze (1981) argued that reading ability encompasses various facets including recognition skills, comprehension aptitude, inferential capabilities, among others; each playing a crucial role in successful engagement with textual material. Zhao Qing (2018) advocated for the implementation of Achieve3000 assessment system which effectively gauges students' language proficiency levels while simultaneously providing culturally enriching content. Conversely, Hu Tiantian and Fan Xiuren (2017) critically analyzed domestic assessment tools and cautioned against their improper usage leading to a nihilistic approach towards English reading education characterized by an overemphasis on superficial details resulting in an abundance of rote memorization rather than fostering genuine reading competence.
With the reform of English education in China, the teaching significance of English reading should not solely revolve around testing (Hu,2020). For students, the practical application of English reading surpasses mere examination purposes (Vidakovi & Vidakovi, 2021). Moreover, accurately understanding students' reading levels necessitates the utilization of assessment tools (Clark, 2019). Presently, there exists a wide range of English testing tools including electronic assessment software, mobile applications, and various practice test papers (Wang, 2022). This study conducts a comparative analysis between two primary forms of assessment

through paper-based (Cambridge IELTS) evaluation as well as online assessment (Star reading test) accompanied by questionnaire surveys and semi-structured interviews involving 200 freshmen. The objective is to assist teachers and students in selecting more suitable methods for reading assessments by analyzing the advantages and disadvantages associated with these two types of evaluations. Furthermore, this aims to enhance the reading assessment system while optimizing English teaching practices. By effectively integrating analysis results with teacher and student evaluations, a dynamic and comprehensive evaluation system can be established to improve the quality of English reading instruction.

II. LITERATURE REVIEW

A. English Reading

The process of English reading involves the cognitive abilities of cognition, understanding, and reasoning to comprehend each chapter (Rumelhart, 1980; Alderson, 1990; McNamara, 2007). According to Zeng (2020), English reading comprehension ability refers to language learners' capacity to construct meaning from reading materials using language knowledge, non-language knowledge, and strategies. Zhuang Xin and Xiang Danfeng (2016) propose that reading ability encompasses readers' steady engagement with various types of articles within a specific timeframe. This includes internal factors such as understanding, memory, and speed as well as external factors like environment, self-awareness, and strategy application that influence the development of reading ability. Guo Dan (2020), through an analysis of the definition of reading in the new national curriculum and PISA assessment framework believes that reading ability is being replaced by the concept of reading literacy. PISA 2018 defines reading literacy as the capability to comprehend texts effectively for personal goals achievement, knowledge enhancement, potential development, and active participation in social life. Additionally, PISA2025 emphasizes "fluent reading skills", "information acquisition", and "text comprehension ability" as key components for assessing foreign language reading proficiency in 2025.

B. English Reading Assessment

Chinese scholar Liang Meizhen (2012) has highlighted that assessment plays a crucial role in expanding students' text reading channels, strengthening their reading practice ability, enhancing opportunities for speech construction and output expression, and promoting hierarchical teaching through the analysis of the insights from PISA (2008) on high school English reading instruction. Wang Jianna (2016), drawing upon language ability theory and communicative language skills and components, developed a business English reading proficiency scale by referring to various business English reading syllabi, testing standards, scoring criteria, as well as incorporating expert and teacher input. Hu Tiantian and Fan Xiuren (2017) conducted an extensive analysis on the impact of English reading assessment on teaching practices in China. In 2018, Zhao Qing (2018) examined the effectiveness of the Achieve3000 assessment system in college-level English reading instruction. The study concluded that assessments could assist teachers in determining whether the difficulty level of reading materials aligns with students' abilities while facilitating more effective hierarchical teaching based on assessment results. Through the analysis of English reading assessment in high school, Wu Hanfan (2020) argues that there exist disparities between the existing assessment tools and reading instruction. He contends that while the assessment generally encompasses the reading skill objectives outlined in teaching, it lacks comprehensive coverage of these skills. Specifically, aspects such as predicting text content based on titles, understanding text structure, recognizing linguistic features within texts, and comprehending discourse meaning through repetition and explanation are not adequately reflected in the test. In summary, based on the relevant research on English reading and its assessment, it is evident that scholars both domestically and internationally have acknowledged the significant impact of reading assessment on reading instruction. However, there exists a wide range of tools for conducting reading assessments. Most of the scholarly research has primarily focused on traditional paper-and-pencil tests such as high school entrance examinations, college entrance examinations (CET-4 and CET-6), as well as TEM-4 and TEM-8. Conversely, online English tests are relatively scarce in China. Currently, only the China English Reading Education Research Institute has independently developed an assessment based on the Chinese English Reading Standards for Primary and Secondary School Students (Experiment Draft), which exclusively targets primary and secondary schools. International English reading ability tests predominantly include AR, achieve 3000, PISA, star reading test among other globally recognized online assessments. Throughout domestic and international research endeavors thus far conducted by scholars in this field, extensive investigations have been carried out regarding test utilization; however, limited attention has been given to exploring various types of assessments available. Taking IELTS reading and star reading test as examples for comparison purposes with paper-and-pencil tests versus online assessments from perspectives including student feedback mechanisms employed during testing sessions; types of questions posed within each respective examination format; areas emphasized within these exams; provision of result feedback; teaching guidance offered post-assessment completion etc., this study aims to optimize English reading assessment practices while simultaneously promoting effective teaching methodologies through comprehensive evaluation processes.

III. METHODOLOGY

A. Research Objective and Research Question
Research objectives and research questions of this study are as follow:

Table 1: Research questions and research objectives

Research questions	Research objectives
1.What are the advantages and disadvantages of paper-based English reading assessments?	1.To investigate the advantages and disadvantages of paper-based English reading assessments
2. What are the advantages and disadvantages of online English reading assessments?	2.To investigate the advantages and disadvantages of online English reading assessments

B. Instruments
The Cambridge IELTS reading test was utilized as the paper-based English reading level assessment in this study, while the Star Reading test was employed for online testing.

a. Star Reading test
The STAR Reading Test is specifically designed to assess the reading comprehension skills and abilities of students in grades 1-12 (America). Developed by Renaissance Learning, this comprehensive examination evaluates students' knowledge of reading and language across a wide range. The test encompasses 49 skill areas distributed among five domains: analyzing literary text, word skills and knowledge, analyzing argumentation and evaluating text, employing comprehension strategies, and constructing meaning, as well as understanding the author's craft. (Sands, B.,2021).

b. Cambridge IELTS 17
  The International English Language Testing System (IELTS) is globally acknowledged as the foremost assessment for international English proficiency, with recognition from over 10,000 institutions across more than 140 countries and territories. Moreover, it attracts an annual participation of over 3 million individuals (Zhu,2000). On January 15, 2019, the National Examinations Authority of China's Ministry of Education and the British Council jointly announced the outcomes of their research on aligning the Chinese English Proficiency Scale with IELTS and General Thinking Test. This milestone signifies that IELTS, and Puss have become the inaugural language proficiency assessments to successfully integrate with the Chinese English Proficiency Scale (The Xinhua News Agency, 2019).
The Cambridge Official IELTS Test Papers 17 Academic, published by Cambridge University Press in 2022, encompasses four IELTS test papers. The IELTS Reading Test A, also known as the Academic Reading section, focuses on academic reading comprehension and consists of three passages with a total word count ranging from 800 to 1000 words. This section comprises a total of 40 questions, with the first two passages containing 13 questions each and the last passage containing 14 questions. Candidates are given a time limit of 60 minutes to complete the IELTS Reading Test A, allowing an average of approximately 1.5 minutes per question. With its three passages and corresponding set of questions totaling up to 40 items, this section carries a maximum score of nine points.

c. The English Reading Assessment Questionnaire
The English Reading Assessment Questionnaire is developed based on the Chinese English Reading Scale and collaboratively compiled by a team of experienced English teachers and esteemed professors. Its validity and reliability have been established through rigorous pilot experiments.

C. Research progress
This study is divided into three parts. *The first part consists* of a reading test, where 200 students respectively received the Cambridge English IELTS (Academic) 17 test 1 reading section and the star reading test. *The second part involves* a questionnaire survey, in which students complete a reading evaluation questionnaire based on their test experience and record the results. *In the third part*, ten test takers are randomly selected for semi-structured interviews to further explore their insights, with the results being recorded. The collected data from the tests, questionnaire survey, and interviews will be analyzed to draw conclusions.

D. Participants
The participants of this study consisted of 200 college students aged 18-22, who were selected based on their successful completion of China's National College Entrance examination and demonstrated a certain level of proficiency in the English language. The participants will be required to complete two types of reading level tests and questionnaires, while a subset of 10 individuals will also be selected for participation in semi-structured interviews.

IV.   RESULT AND DISCUSSION

The findings were derived from empirical examinations, surveys, and structured interviews.

A. Assessment focus
a. Cambridge IELTS
Taking Cambridge IELTS 17 as an exemplar, the reading section comprises a total of 40 questions, encompassing 16 completion-based queries, 9 multiple-choice items, 11 identifying information inquiries, and 4 matching tasks. These diverse question types effectively assess test takers' comprehensive understanding by evaluating their ability to comprehend literal meaning, engage in reinterpretation and evaluation, provide personal responses, make inferences, and analyze authors' rhetorical strategies.

Fig. 1 Example of IELTS reading test

b. Star Reading test
The Star Reading test comprises of 34 multiple choice questions, with the first 10 focusing on vocabulary and the remaining 24 assessing reading comprehension skills. There are five main section of star reading test: word knowledge and skills, comprehension strategies and constructing meaning, analyzing literary text, understanding author's craft, and analyzing argument and evaluating text. However, there is only multiple-choice items in the test.
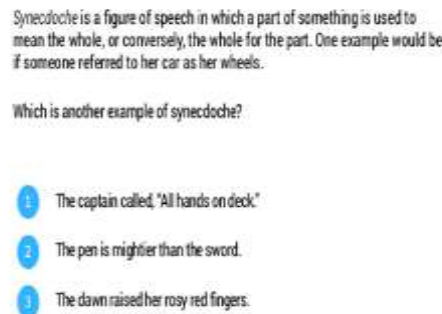

Fig. 2 Example Star Reading test questions

The comparison reveals that the paper-based reading test encompasses a greater number of questions in contrast to the online test. Simultaneously, the paper-based test materials encompass paragraphs, sentences, or complete articles as options. Conversely, the online test primarily comprises sentences and short paragraphs with limited inclusion of complete articles.

B. Feedback Contents
The IELTS Reading Test adopts a 9-point scoring system, encompassing both full marks and increments of 0.5. The provided report solely presents the scores of test takers without offering detailed analysis. In case further examination is warranted, educators are required to conduct supplementary analysis on the content. For instance, within this evaluation, only an average score of 4.5 points for students can be derived, with no additional information available. Delving deeper into the test results and questions reveals that students encounter significant difficulties in synonym substitution, as evidenced by a mere 15% accuracy rate across 14 questions. Moreover, when it comes to matching exercises, students struggle with reading attentively within limited time frames as indicated by a success rate of merely 20%.

Fig. 3 Report of IELTS test

The test report of Star Reading contains additional information. It is primarily divided into three sections. The initial section assesses whether the student's performance aligns with the expectations for their grade level.

Fig. 4 Example of the first part of Star Reading test report

The second part is a summary of the student test results. The evaluation results were categorized into four color-coded areas: red for Urgent Intervention, yellow for Intervention, blue for On Watch, and green for at/above Benchmark.

A scaled score (SS) is calculated based on the outcomes of this computer-adaptive test, employing a formula that considers the relationship between the number of accurate responses and question difficulty. Scaled scores for STAR Reading range from 0 to 1400. The tester's Lexile score ranges from 0L to 1700L, indicating the proficiency level of the tester. The Grade Equivalent signifies the grade level corresponding to the tester's score. The Instructional Reading Level indicates the grade level content that is most suitable for the student. ZPD represents the zone of proximal development for the student (see as Fig. 4).

Fig.5 Example of the second part of Star Reading test report

The third part are skill details. Questions on this test cover 49 reading skill areas spread across five domains in three sections (see as table 1).

Table 1: 49 Reading skill areas

Literature		
Key Ideas and Details	Inference and Evidence	Author's Word Choice and Figurative Language
Character	Craft and Structure	Integration of Knowledge and Ideas
Setting	Point of View	Modes of Representation
Plot	Structure of Literary Text	Analysis and Comparison
Theme	Word Meaning	Range of Reading and Level of Text Complexity
Summary	Connotation	
Information text		
Key Ideas and Details	Relationships	Connotation
Prediction	Summary	Integration of Knowledge and Ideas
Main Idea and Details	Craft and Structure	Modes of Representation
Inference and Evidence	Text Features	Argumentation
Sequence	Author's Purpose and Perspective	Analysis and Comparison
Compare and Contrast	Word Meaning	Range of Reading and Level of Text Complexity
Cause and Effect	Organization	

Connections and	Author's Word Choice and Figurative Language	
Language		
Vocabulary Acquisition and Use	Real-Life Word Connections and Applications	Synonyms Word Reference Materials
Word Relationships	Vocabulary in Context	Figures of Speech
Structural Analysis	Antonyms	
Context Clues	Multiple-Meaning Words	

C. Follow-Up Teaching Guidance

Since most of the paper-based test reports only provide the correct answers and final scores, it becomes challenging to directly analyze the results in accordance with the IELTS reading test. After conducting he test content, it can be concluded that students tend to lose more points in areas such as synonym replacement and paragraph matching. Consequently, teachers are still required to delve into the test content to identify specific skill deficiencies among students and adjust their teaching methods accordingly for targeted training.

The Star reading test report provides a comprehensive analysis, allowing for subsequent instructional adjustments based on specific subcategories. For instance, the students' standard score is 595.38, indicating an overall weakness in the proficiency level of the test group. Amongst the three domains assessed, language reading exhibits the highest score; however, vocabulary connotation, word relationship, and vocabulary in context demonstrate low scores with an average below 40. Informational reading displays the lowest score with all four areas—core ideas and details, paragraph structure, knowledge application, and integration ability—averaging less than 40. Moreover, both custom understanding and reading breadth exhibit an average score even lower than 30. By thoroughly analyzing this report's findings, targeted instruction can be implemented to address students' weaknesses.

To conclude, paper-based tests necessitate teachers to conduct secondary analysis, and the outcomes of this analysis are closely linked to the expertise of the analyst. Students find it challenging to identify their weaknesses based on the feedback provided by paper-and-pencil tests. Conversely, online tests assess students' diverse skills and assign corresponding scores accordingly. Teachers can implement hierarchical instruction based on the feedback in the report and offer personalized guidance tailored to individual student needs.

D. Students' evaluation

The preference for paper assessment tools among students is 62.5%. Student A mentioned during the interview that paper reading offers greater convenience for careful examination, and online assessments may pose difficulties in reading lengthy questions. Meanwhile, 48.6% of the students believed that paper-based reading assessments could enhance their reading proficiency. Student B mentioned in the interview that electronic reading often resulted in line skipping or omissions, which hindered accurate evaluation of their true reading abilities. Student F pointed out that paper-based assessments allowed for time control based on question difficulty, whereas online assessments lacked this feature and imposed time limits on each question. Nearly 40% of the students believe that the summary of the passage is more indicative of their reading proficiency. They assert that the purpose of reading lies in comprehending the passage and acquiring knowledge. During interviews, both students A and E emphasized that understanding the meaning of the passage equates to achieving the objective of reading, while students C, D, and E opined that alongside comprehension, grasping vocabulary within the passage is also essential. Over 80% of students advocate for adaptive test questions during reading assessments as it facilitates a convenient means for them to gauge their true level. In all interviews conducted, students unanimously expressed that when perusing printed materials, passages tend to be more challenging than anticipated; evidently surpassing their current abilities without providing an accurate measure thereof. Students generally concur on two primary functions attributed to reading: fostering language skills and gaining knowledge through textual comprehension. Regarding test frequency, over half of all participants reported not taking tests within a month's time frame. The abundance of unfamiliar words emerged as a significant hurdle impeding their understanding during this process. Approximately 60% favored multiple-choice questions over fill-in-the-blank ones in exams due to their ability to infer answers based on context and provided choices, whereas fill-in-the-blank questions necessitate comprehensive understanding post-passage analysis.

In summary, in terms of student evaluation, students tend to prefer paper-and-pencil reading tests due to their reading habits and other factors. However, students also hold the belief that if there is no opportunity to adjust the test difficulty during the assessment process, the obtained results may not accurately reflect their true proficiency level.

V. CONCLUSION

A. Advantages and Disadvantages of paper-based test
a. Advantages of paper-based test
There are two main merits of paper-based test:

Firstly, Easy to read. The findings from the questionnaire survey and interviews indicate that the test takers generally hold the belief that the paper-based reading test is more user-friendly, as it remains unaffected by external factors such as internet connectivity and power supply. Secondly, Rich in test types. The paper-based reading test is highly versatile in form, as it demonstrates resilience against external influences, thereby enabling comprehensive assessment of text comprehension from various perspectives and dimensions.

b. Disadvantages of paper-based test

 The advantages of paper-based reading tests are undeniably apparent; however, it is imperative to acknowledge their inherent limitations. First, it is difficult for paper-based tests to be dynamically adjusted in real time based on the proficiency level of the test taker. The presence of this factor renders it unfeasible to precisely assess the actual proficiency level of the examinee. In addition, the report of paper-based test is insufficiently comprehensive to accurately capture the issues that arise during the tester's reading process. Furthermore, if educators do not analyze the test materials themselves, the test cannot provide sufficient guidance for following teaching activities. The analysis of test materials imposes a significant level of demands on educators. For the testers themselves, it is more difficult to analyze the results of the test.

B. Advantages and Disadvantages of online test
a. Advantages of online test

 With the developing of technology, online test become a trend. There are several advantages of online test. The first one is Dynamic adaption. Unlike paper-based tests, online tests can easily adapt to test takers' level dynamically based on their answers of them. The adaptation system enables educators to assess students' proficiency level. Moreover, the comprehensive report also aids educators in formulating future instructional plans. Simultaneously, the test takers can readily identify the deficiencies in their reading skills.

b. Disadvantage of online test

The analysis above indicates that online reading test is conducive to a more comprehensive understanding of students' reading proficiency. Additionally, the utilization of detailed report forms can facilitate improved planning for both students and teachers in their subsequent steps. However, it is worth noting that there are certain limitations associated with online reading assessments. Primarily, due to technological influences and reading habits, online reading often involves fragmented passages and sentences rather than complete articles. Consequently, such materials may not accurately assess students' ability to comprehend full-length texts. The second aspect is that, to achieve self-adaptation, the question types of online tests primarily consist of multiple-choice questions. A single question type does not facilitate a comprehensive assessment of the tester's overall proficiency level.

Table 2: Advantages and Disadvantages of paper-based test and online test

Tools	Advantages	Disadvantages
Paper-based	Easy to read	Unable to adapt dynamically
	Rich in test types	Excessively concise report
		Limitation of further guidance
Online test	Dynamical adaption system	Single type of question
	Detailed report	Difficulties in reading long texts
	Precise follow-up instruction	

In conclusion, both paper-based and online reading tests possess their own advantages and disadvantages. Therefore, future development of reading assessments should consider integrating the strengths of both formats while utilizing test results as a guiding tool for English reading instruction to better cultivate students' language proficiency and contribute to national international development.

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