The Relationship Between Reading Speed and Comprehension: A Diagnostic Study with AceReader

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Abstract: This diagnostic study investigates the relationship between reading speed and reading comprehension among Indonesian EFL learners using the digital assessment tool, AceReader. Thirteen participants completed three reading texts, each followed by comprehension questions. Reading speed (wpm) and comprehension scores (%) were recorded and averaged. Descriptive analysis revealed mean reading speeds of 107.8, 143.2, and 131.5 wpm across the three texts, and comprehension means of 75%, 55.8%, and 63.5%, respectively. The standard deviation values indicate moderate to high variability in both reading speed and comprehension. Linear regression analysis showed no statistically significant relationship between reading speed and comprehension ($R^2 = 0.005$, $p = 0.820$). These results suggest that reading speed alone does not predict comprehension ability. The study highlights the complexity of reading fluency in EFL contexts and calls for a more integrated approach to reading instruction and assessment.

Keyword: reading speed, comprehension, AceReader, EFL learners, diagnostic study

INTRODUCTION

Reading is a foundational skill in second language acquisition, serving as a gateway to vocabulary development, grammatical awareness, and overall language proficiency (Grabe, 2009). Reading fluency often defined as the ability to read accurately, quickly, and with proper comprehension is a key component of effective reading (Kuhn & Rasinski, 2011). In English as a Foreign Language (EFL) context, fluency development is often neglected in favor of accuracy and decoding, leading to students who read slowly or with limited comprehension.

One dimension of fluency that has drawn considerable research interest is the relationship between reading speed and reading comprehension. Some studies suggest that faster readers tend to comprehend more because they can process and integrate information more efficiently (Carver, 1992). However, other findings point out that rapid reading may sacrifice depth of understanding, particularly when students attempt to increase speed without appropriate strategies or familiarity with text genres (Grabe & Stoller, 2013). Therefore, the link between reading speed and comprehension remains an open empirical question, especially in non-native English settings where both skills may develop unevenly.

With the rise of digital tools in education, platforms like AceReader have made it easier to assess and train reading speed and comprehension. AceReader is an online program that provides timed reading texts followed by comprehension questions, offering measurable insights into reading fluency. While most prior research on AceReader emphasizes its effectiveness as a training tool (e.g., Prince & Tiernan, 2017), fewer studies explore its function purely as a diagnostic instrument to profile learners' baseline reading skills.

This study addresses that gap by investigating the relationship between reading speed and comprehension using AceReader as an assessment tool only (no training provided). The study focuses on a sample of Indonesian EFL learners and seeks to answer the following research question:

Is there a significant relationship between reading speed and reading comprehension when measured using AceReader among EFL students?

By analyzing descriptive and regression data from three reading tasks, this study contributes to understanding whether higher reading speed correlates with greater reading comprehension, and what this might mean for EFL assessment and instruction.

Literature Review

Correlation with reading program

Smith's study on the Accelerated Reader program indicates that while there was an increase in overall reading scores, it did not significantly enhance reading comprehension among students(Smith, 2016).

This suggests that while reading programs can improve speed, they may not always translate to better comprehension.

Speed Reading Techniques

In case of speed reading techniques, Banditvilai's research highlights the effectiveness of speed reading techniques such as prediction, skimming, and scanning, which improved students' comprehension capabilities and fostered positive attitudes towards reading(Banditvilai, 2003).

Then, Tran and Nation's findings support this by showing that speed reading courses can enhance reading speed without negatively impacting comprehension, indicating a potential area for AceReader's application(Tran & Nation, 2014).

The research showed that implementation of speed reading techniques can enhance quality of reading among students.

Practical Applications in University Settings

Even though, university students supposed in the upper intermediate level, but actually, the facts that not all of them having reading as their habit, influence their speed reading and comprehension. So, it need conduct the research to examine their ability in reading.

Barboza-Palomino and Ventura-León's study found a moderate effect of a reading program on speed but not on comprehension, emphasizing the need for effective methodologies in university contexts(Barboza-Palomino & Ventura-León, 2017).

Conversely, Munir et al. demonstrated significant improvements in comprehension through structured speed-reading sessions, suggesting that targeted interventions can yield positive results(Munir et al., 2024).

In contrast, while many studies indicate potential benefits of speed reading, some also highlight limitations in comprehension improvements, suggesting a need for a balanced approach in educational strategies.

These results align with previous findings that suggest speed reading can enhance reading efficiency without compromising comprehension (Gadissa & Tegegne, 2022). However, the improvement in comprehension was less pronounced than the increase in speed, suggesting that speed reading should be complemented with comprehension strategies.

METHOD

This study involved 13 EFL students enrolled at an Indonesian higher education institution, students majoring in Communication Science at the Faculty of Social and Political Sciences, exactly. The participants were selected using convenience sampling and came from similar educational backgrounds,

with intermediate-level English proficiency. All participants provided informed consent prior to participation. No prior training or instruction using AceReader was given before the testing session.

Instrument

The primary instrument used in this study was AceReader, a web-based tool designed to measure and train reading fluency. AceReader provides timed reading texts and evaluates both Reading Speed (RS) in words per minute (wpm) and Reading Comprehension (RC) in percentage (%) scores based on multiple-choice questions following each text.

Three reading passages of similar length and difficulty were administered sequentially. Each passage was followed by five comprehension questions.

Data Collection Procedure

The test was conducted in the class using gadget. Participants were given instructions on how to use the AceReader interface. Each student completed three reading tasks on the platform. After reading each passage under time constraints, they answered comprehension questions without the ability to refer back to the text. The reading speed and comprehension scores were recorded automatically by the software.

Data Analysis

The collected data were processed using descriptive and inferential statistics:

- Mean and standard deviation were calculated for reading speed and comprehension scores across the three texts.
- A simple linear regression analysis was conducted to examine the relationship between reading speed (independent variable) and comprehension (dependent variable). The analysis aimed to determine whether a statistically significant correlation existed between the two variables.

RESULTS AND DISCUSSION

Based on the data, the average of reading speed and reading comprehension can be drawn as follow.

Table 1. Score of Reading Speed and Comprehension

No.	Participant	RS Text 1 (wpm)	RC Text 1 (%)	RS Text 2 (wpm)	RC Text 2 (%)	RS Text 3 (wpm)	RC Text 3 (%)
1	YZ	76	75	95	100	388	75
2	Sy	45	100	95	75	95	0
3	Bu	100	25	110	75	94	75
4	Rs	66	75	103	75	89	75
5	Rnl	131	75	126	75	100	75
6	Bi	140	50	257	0	113	75
7	WM	96	50	207	50	102	25
8	Nz	123	50	268	25	100	25
9	Ga	194	100	154	75	149	100
10	Slm	119	100	140	50	115	75
11	Hfz	141	100	111	25	108	75

12	Az	87	100	98	50	136	75
13	Le	83	75	97	50	121	75
	Mean	107.8	75	143.2	55.8	131.5	63.5

To find standard deviation from each column, used by formula:

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \mu)^2}$$

Where:

- σ = population standard deviation
- N = total number of data points (population size)
- Xi = each individual data point
- μ = population mean

By using this formula, the standard deviation results for each column are as follows:

Table 2. Standard Deviation of Reading Speed and Comprehension

Column	Standard Deviation
RS Text 1 (wpm)	39.17
RC Text 1 (%)	25.00
RS Text 2 (wpm)	61.64
RC Text 2 (%)	27.30
RS Text 3 (wpm)	78.95
RC Text 3 (%)	28.17

Explanation:
RS = Reading Speed (words per minute / wpm)
RC = Reading Comprehension (percentage/%)
Standard deviation counted using formula for sample (n-1)

Then, calculate the regression analysis to determine the effect of reading speed on reading comprehension using simple linear regression formula:

$$Y = a + bX$$

Where:
Y = dependent variable (Reading Comprehension/RC Average)
X = independent variable (Reading Speed/RS Average)
a = intercept (value of Y when X=0)
b = regression coefficient (how much Y changes when X increases by 1 unit)

Data Used
X (RS Average) = the average reading speed from 3 texts
Y (RC Average) = the average reading comprehension score from 3 texts
n = 13 participants

Regression Result
$\hat{Y} = 69.27 - 0.0355X$

Intercept (a) = 69.27
Coefficient (b)= -0.0355
For every 1 unit increase in reading speed (wpm), comprehension decreases by 0.0355%, on average — but this effect is not statistically significant.

Significance Test Summary
To know the relationship between speed reading and reading comprehension, below the results of significance test:

Table 3. Significance Test Summary

Statistic	Value
R-squared	0.005
p-value (coefficient)	0.820
F-statistic	0.055
p-value (F-test)	0.820

R-squared = 0.005: Only 0.5% of the variation in comprehension can be explained by reading speed.
p-value (coefficient) = 0.820: Greater than 0.05 → not statistically significant
Overall model is not significant.

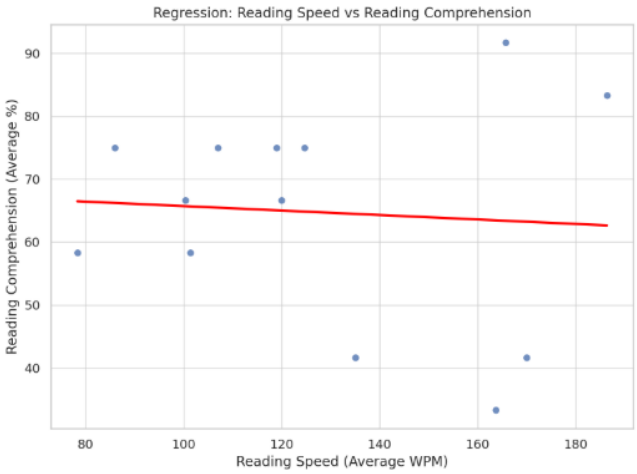

Figure 1. The regression plot

Here's the regression plot showing the relationship between reading speed and reading comprehension:

- Dots represent individual participants.
- The red line is the regression line based on the model.
- The line is almost flat, which visually confirms the very weak or no correlation between reading speed and comprehension.

The findings of this diagnostic study revealed no significant relationship between students' reading speed and comprehension scores, as measured using AceReader. The regression model produced an R^2 value of only 0.005, indicating that reading speed explained less than 1% of the variance in comprehension scores. The p-value of 0.820 further suggests that the relationship is statistically non-significant.

This result challenges the common assumption that faster reading inherently leads to better comprehension. In this sample, students who read more quickly did not necessarily understand the material better, and vice versa. This aligns with findings by Taguchi et al. (2004), who emphasized that fluency requires a balance between speed and comprehension, rather than an exclusive focus on either. Moreover, Grabe (2009) argues that while fluent readers often read more rapidly, comprehension is mediated by multiple cognitive and linguistic factors, including vocabulary knowledge, background knowledge, and syntactic processing.

Several factors may explain the weak correlation in this study. First, the sample size was relatively small (n = 13), which limits statistical power and generalizability. Second, the study relied on a single session of testing without any intervention or training phase. As such, it offers only a "snapshot" of each student's reading behavior, which may not capture deeper patterns or learning potential. Third, individual differences — such as test anxiety, familiarity with digital texts, or motivation — may have influenced both reading speed and comprehension independently.

Another important consideration is that AceReader was used only diagnostically, rather than as part of a longitudinal intervention. Prior studies (e.g., Prince & Tiernan, 2017) have shown improvements in reading fluency after several weeks of using AceReader's training modules. Therefore, the absence of a significant relationship in this study does not imply that AceReader is ineffective, but rather that speed and comprehension, as isolated variables, do not strongly correlate in a single-time, pre-test context.

These findings have implications for EFL teaching and assessment. First, teachers should avoid equating fast reading with reading proficiency. Assessment of reading fluency should include both speed and comprehension components, but treat them as distinct yet complementary skills. Second, digital tools like AceReader may be more useful when implemented as part of a sustained training program, rather than as stand-alone assessments.

Future research should consider using larger samples, incorporating post-test data after AceReader training, and examining additional factors such as text complexity, student attitudes, and working memory. A mixed-methods design could also help uncover learner strategies and explain why some students excel in comprehension despite slower reading.

CONCLUSION

This study explored the relationship between reading speed and comprehension among EFL students using AceReader as a diagnostic tool. The results, derived from one-time testing, demonstrated that reading speed and comprehension were not significantly correlated ($R^2 = 0.005$, $p = 0.820$). Descriptive statistics also revealed wide variation in both speed and comprehension levels, indicating diverse reading profiles among the learners.

These findings suggest that reading speed alone is not a reliable predictor of comprehension ability in EFL learners. Although digital platforms like AceReader can provide useful baseline assessments, interpreting results requires caution. Educators should consider reading fluency as a multifaceted skill and avoid relying solely on speed measures when evaluating students' reading proficiency.

The study reinforces the need for comprehensive, ongoing assessment and possibly the inclusion of structured fluency training to meaningfully develop both reading speed and comprehension. Future studies should involve larger sample sizes, longitudinal data collection, and possibly integrate training modules within digital tools to better understand how these two components of fluency develop over time.

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