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The Effect of Online Dictionary Use and Learning Motivation on Senior High School Students' Reading Comprehension in English

Nanik Pujiastuti[1], Wawan Gunawan[1], Nukmatus Syahria[1]
[1]Faculty of Educational Technology University of PGRI Adi Buana
Jl Dukuh Menanggal XII No 4 Gayungan 60234 Kota Surabaya
*E-mail Korespondensi : pujiastuti@unipasby.ac.id
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Abstrak

Kompetensi membaca sangat mendasar bagi perkembangan intelektual dan pribadi siswa, khususnya dalam memperoleh kemahiran berbahasa asing. Studi ini meneliti pengaruh penggunaan kamus daring dan motivasi belajar terhadap pemahaman bacaan bahasa Inggris di kalangan siswa sekolah menengah. Dengan menggunakan desain kuantitatif kuasi-eksperimental dengan pendekatan komparatif dan korelasional, 131 siswa kelas sepuluh dari SMAN 1 Madiun berpartisipasi. Data dikumpulkan menggunakan tes pemahaman bacaan standar dan kuesioner motivasi 30 item yang telah divalidasi. Hasil menunjukkan bahwa penggunaan kamus daring dan motivasi belajar keduanya berkorelasi positif dengan pemahaman bacaan ($r = 0{,}797$ dan $r = 0{,}980$, masing-masing; $p < 0{,}001$). Analisis ANOVA dua arah mengungkapkan efek utama yang signifikan dari penggunaan kamus daring ($F = 106{,}919$, $p < 0{,}001$, $\eta^2 = 0{,}457$) dan motivasi belajar ($F = 5{,}943$, $p = 0{,}016$, $\eta^2 = 0{,}045$), tanpa efek interaksi yang signifikan ($p = 0{,}133$). Temuan ini menyoroti pentingnya mengintegrasikan alat digital dan strategi motivasi untuk memperkuat pemahaman bacaan bahasa Inggris.

Kata Kunci: pemahaman bacaan, motivasi belajar, kamus daring, studi kuasi-eksperimental

Abstract

Reading competence is fundamental to students' intellectual and personal development, particularly in acquiring foreign language proficiency. This study examined the effects of online dictionary use and learning motivation on English reading comprehension among secondary school students. Employing a quasi-experimental quantitative design with comparative and correlational approaches, 131 tenth-grade students from SMAN 1 Madiun participated. Data were collected using a standardized reading comprehension test and a validated 30-item motivation questionnaire. Results showed that online dictionary use and learning motivation were both positively correlated with reading comprehension ($r = 0.797$ and $r = 0.980$, respectively; $p < 0.001$). Two-way ANOVA revealed significant main effects of online dictionary use ($F = 106.919$, $p < 0.001$, $\eta^2 = 0.457$) and learning motivation ($F = 5.943$, $p = 0.016$, $\eta^2 = 0.045$), with no significant interaction effect ($p = 0.133$). These findings highlight the importance of integrating digital tools and motivational strategies to strengthen English reading comprehension.

Key words: *reading comprehension, learning motivation, online dictionary, quasi-experimental study*

INTRODUCTION

Education is a key determinant of national progress, shaping individuals who are intellectually capable and morally grounded. In the digital era, educational systems must continuously adapt to technological advancement while addressing persistent challenges such as low student motivation and limited access to effective learning resources (Wahib et al., 2022; Akbar & Noviani, 2019). English proficiency has become an essential skill for success in academic, social, and professional contexts. Among the four language skills, reading comprehension forms the foundation for knowledge acquisition and critical thinking (Tambusa & Khairina, 2022). However, many Indonesian high school students still struggle to comprehend English texts due to limited vocabulary and grammatical understanding (Susanthi, 2020). This problem calls for innovative learning strategies that integrate both digital tools and motivational approaches.

Recent advances in educational technology have introduced various media to support language learning, including interactive videos, online games, and digital dictionaries (Waloyo et al., 2021). Among these, online dictionaries provide fast and contextual access to word meanings, examples, and pronunciation, which can facilitate vocabulary growth and reading comprehension (Priediansyah et al.,

2022; Fadila, 2019). Studies have shown that learners using online dictionaries exhibit greater independence and engagement in understanding English texts.

Learning motivation also plays a critical role in determining student achievement (Santosa, 2017). According to Self-Determination Theory (Deci & Ryan, 2000), intrinsic motivation—driven by curiosity and competence—and extrinsic motivation—driven by external rewards—jointly influence students' learning persistence. Low motivation often limits students' willingness to use technology effectively (Widodo & Winarti, 2019). Therefore, combining technology integration with motivational support may improve students' reading comprehension outcomes.

Despite growing research on digital learning, few studies have jointly examined the effects of online dictionary use and learning motivation on English reading comprehension, particularly in Indonesian high school contexts. This study addresses that gap by analyzing how both factors contribute to students' reading performance. The findings are expected to provide empirical evidence and pedagogical insights for enhancing English instruction through the integration of digital learning tools and motivational strategies.

RESEARCH METHOD

Research Design

This study adopted a quantitative quasi-experimental design using a non-equivalent control group approach. The design was employed to measure the effects of two independent variables—online dictionary use and learning motivation—on students' English reading comprehension as the dependent variable. Two intact classes were assigned as the experimental and control groups. The experimental group used online dictionaries as learning support, whereas the control group received conventional instruction without digital tools.

Research Site and Duration

The study was conducted at SMAN 1 Madiun, Indonesia, during the second semester of the 2024/2025 academic year. The entire process spanned approximately 20 weeks, from January to April 2025. The timeline consisted of four stages: (1) preparation and instrument validation (January, Week 3), (2) classroom implementation for both groups (late January to mid-March), (3) post-testing and questionnaire administration (April, Week 3), and (4) data analysis and report writing (May–June).

Participants

The population consisted of tenth-grade students at SMAN 1 Madiun during the 2024/2025 academic year. Two classes were purposely selected based on recommendations from English teachers, considering relatively low academic performance and motivation compared to other classes. Each class comprised 36 students, resulting in a total sample of 72 participants. Class X1 served as the control group, and Class X2 served as the experimental group. Both groups were comparable in terms of prior English proficiency, motivation, and reading ability. Participation was voluntary, and confidentiality was ensured throughout the study.

Instruments

Reading Comprehension Test

A multiple-choice reading comprehension test comprising 40 items was developed based on national English curriculum standards. The test assessed key indicators such as identifying main ideas, specific information, sequence of events, character traits, communicative purpose, vocabulary meaning, and text structure. The test covered narrative and descriptive text types, reflecting levels of Bloom's taxonomy from knowledge to evaluation. Each correct response was scored as 2.5 points, producing a maximum total of 100.

Learning Motivation Questionnaire

A 30-item Likert-scale questionnaire (1 = strongly disagree to 5 = strongly agree) was used to measure students' learning motivation. The items were grouped into dimensions of interest in using online

dictionaries, perceived effectiveness, usage frequency, ease of access, perceived comprehension improvement, technological awareness, vocabulary assistance, learning persistence, confidence, and enjoyment in reading activities. The maximum score was 150.

Instrument Validity and Reliability

Content validity was established through expert judgment by three senior English educators who reviewed the alignment between items and curriculum objectives. Construct validity and reliability were analyzed using SPSS version 25. The reading comprehension test and motivation questionnaire demonstrated strong reliability with Cronbach's α coefficients of 0.89 and 0.91, respectively, indicating high internal consistency ($\alpha > 0.80$).

Data Collection Procedure

The research procedure comprised three main phases. Preparation: The instruments were validated, and permission was obtained from the school. Implementation: Over eight weeks of instruction, the experimental group used online dictionaries (e.g., Cambridge Dictionary, Oxford Learner's Dictionary) during reading tasks, while the control group used printed dictionaries and teacher explanations. Assessment: Both groups completed the reading comprehension test and the motivation questionnaire under researcher supervision at the end of the learning period.

Data Analysis

Data were analyzed using descriptive and inferential statistics via IBM SPSS Statistics version 25. Descriptive statistics summarized mean and standard deviation scores for reading comprehension and motivation. Prior to hypothesis testing, normality was assessed using the Kolmogorov–Smirnov test, and homogeneity of variance was checked with Levene's test. Data were considered normal and homogeneous when $p > 0.05$. Subsequently, Pearson's product–moment correlation examined relationships among variables. To determine the main and interaction effects of online dictionary use and motivation on reading comprehension, a two-way analysis of variance (Two-Way ANOVA) was conducted. Statistical significance was set at $p < 0.05$, and effect sizes (η^2) were interpreted according to Cohen's guidelines: small ($\eta^2 = 0.01$), medium ($\eta^2 = 0.06$), and large ($\eta^2 \geq 0.14$).

RESULTS AND DISCUSSION

Participant Characteristics

A total of 131 tenth-grade students from four classes at SMAN 1 Madiun participated in this study. Participant selection followed a purposive sampling strategy based on their access to and experience with online dictionaries during English learning. Specifically, students from Classes X1 and X2 were identified as regular users of online dictionaries, whereas students from Classes X8 and X9 reported little or no use of such tools in their reading activities. This distinction formed the foundation for the comparative analysis aimed at examining how online dictionary use and learning motivation—individually and interactively—affect English reading comprehension.

All participants were enrolled in the same academic level and followed an identical English curriculum under Indonesia's national education system. This uniformity ensured that differences in outcomes could be more confidently attributed to variations in learning behavior and motivational dispositions rather than instructional content. Participants were aged between 15 and 17 years, reflecting a typical demographic profile of Indonesian high school students. Each student completed two instruments: a researcher-designed English reading comprehension test (maximum score: 100) and a standardized 30-item learning motivation questionnaire (maximum score: 150), both adapted and validated for the Indonesian EFL context. No subgroup analysis was conducted based on demographic factors such as gender or socioeconomic background, as these fell outside the scope of this study. However, all students had comparable access to digital learning facilities, including computer laboratories and school internet resources, minimizing potential inequality in access to online tools.

Overall, the sample can be characterized as academically consistent, digitally literate, and representative of urban or semi-urban Indonesian high school learners. The shared institutional and curricular background reinforced the study's internal validity, allowing observed differences in reading comprehension or motivation to be interpreted primarily as effects of individual learning behaviors—especially the use or non-use of online dictionaries.

Validity and Reliability of the Learning Motivation Questionnaire

Instrument validity and reliability testing ensured that the motivation questionnaire accurately and consistently measured the intended construct. Item-total correlations were examined using the Pearson Product–Moment method in SPSS. All 30 items demonstrated correlation coefficients (r) exceeding the critical value ($r_{\alpha\beta e}$ = 0.436, N = 30, α = 0.016), ranging between 0.412 and 0.782, and were statistically significant at the 5% level. Hence, all items were considered valid indicators of the learning motivation construct.

Reliability testing was conducted using Cronbach's Alpha. The instrument produced an α value of 0.904, indicating excellent internal consistency (α > 0.9). This result confirms that the items collectively measured the construct cohesively and consistently. Therefore, the motivation questionnaire used in this study demonstrated both strong validity and reliability, ensuring high confidence in the interpretability of the motivational data and supporting the study's internal consistency.

Descriptive Statistics

Descriptive statistical analysis was conducted to provide an overview of students' English reading comprehension and learning motivation prior to inferential testing. The English reading comprehension test, aligned with the national curriculum and international reading frameworks (e.g., PISA, TOEFL descriptors), comprised items assessing literal understanding, inferential reasoning, and evaluative judgment. The mean reading comprehension score was 81.90 (SD = 7.71), with scores ranging from 64 to 96. The relatively high mean and moderate standard deviation indicate that most students exhibited competent English reading comprehension with limited variation across the sample.

In parallel, students' learning motivation, measured via a 30-item Likert-scale questionnaire, yielded a mean score of 119.95 (SD = 7.91), with scores ranging from 101 to 137. Given a theoretical midpoint of 90, these findings suggest that participants exhibited high overall motivation. The motivation scores showed minimal skewness (–0.050), indicating a symmetrical distribution concentrated in the upper range. This pattern reflects a uniformly high motivational climate among the students, likely influenced by positive school culture, academic aspirations, and familiarity with English as a global language.

Classification of Motivation Levels

To further interpret students' motivational profiles, raw motivation scores were classified into three ordinal categories—low (30–70), moderate (71–110), and high (111–150)—based on established thresholds commonly applied in second language motivation research. The results revealed that no student fell into the low-motivation category. A total of 118 students (90.1%) demonstrated high motivation, while 13 students (9.9%) exhibited moderate motivation. The overwhelming dominance of high motivation levels indicates a learning environment that effectively sustains student engagement and intrinsic interest in English learning.

The absence of low-motivation participants is noteworthy, suggesting that demotivating factors such as fear of failure or lack of resources were minimal in this setting. However, the limited variability in motivation may constrain its predictive strength in explaining differences in reading comprehension outcomes. Nevertheless, even subtle variations between moderate and high motivation remain analytically valuable. These findings also align with recent studies emphasizing that digitalized learning environments—characterized by access to online dictionaries, mobile apps, and interactive language tools—enhance learner autonomy and motivation.

Visualization of Reading and Motivation Scores

To visualize the relationship between reading comprehension and learning motivation, scatterplots and boxplots were generated. These visual representations provided intuitive insights into potential trends and distributional patterns, complementing the descriptive and inferential statistics. Both diagrams suggested a positive linear trend between students' motivation and reading comprehension performance, indicating that more motivated learners tended to achieve higher reading scores.

Tests of Normality and Homogeneity

Before conducting inferential analyses, assumptions of normality and homogeneity were tested. The Kolmogorov–Smirnov (K–S) test was used due to the sample size ($N > 50$). The K–S test yielded $p = 0.200$ for reading comprehension scores and $p = 0.200$ for motivation scores, both exceeding the 0.05 threshold, confirming that the data were approximately normally distributed. Homogeneity of variance was assessed using Levene's Test, which produced $F = 2.834$, $p = 0.095$. As $p > 0.05$, the assumption of equal variances across groups was met. These results justified the use of parametric tests such as Pearson correlation and Two-Way ANOVA for further analyses.

Correlation between Dictionary Use and Reading Comprehension

The Pearson correlation test revealed a strong, significant positive relationship between dictionary use and English reading comprehension scores ($r = 0.797$, $p < 0.001$). This finding indicates that students who used dictionaries during learning achieved substantially higher reading comprehension scores than those who did not. The magnitude of this correlation suggests that dictionary use accounts for a considerable proportion of variance in reading performance. Pedagogically, this supports structured integration of dictionary use in reading instruction. Encouraging students to develop efficient vocabulary-searching strategies may further optimize comprehension outcomes.

Correlation between Learning Motivation and Reading Comprehension

A similarly strong and statistically significant correlation was observed between learning motivation and reading comprehension ($r = 0.980$, $p < 0.001$). This near-perfect positive relationship indicates that higher levels of learning motivation were closely associated with superior reading comprehension outcomes. The extremely low p-value confirms the robustness of this finding, highlighting motivation as a key determinant of language learning success in the EFL context.

Joint Effects of Dictionary Use and Learning Motivation on Reading Comprehension

A Two-Way ANOVA was performed to assess the independent and interactive effects of online dictionary use and learning motivation on English reading comprehension. The results indicated three key findings: (1) significant main effect of dictionary use ($F(1,127) = 106.919$, $p < 0.001$, partial $\eta^2 = 0.457$). This meant that online dictionary use had a large and substantial impact on reading comprehension; (2) significant main effect of learning motivation ($F(1,127) = 5.943$, $p = 0.016$, partial $\eta^2 = 0.045$). This result showed that motivation contributed meaningfully, though to a lesser extent than dictionary use; (3) interaction effect (dictionary × motivation) ($F(1,127) = 2.283$, $p = 0.133$, partial $\eta^2 = 0.018$). This indicated the influence of dictionary use on reading comprehension was not dependent on students' motivation level, and vice versa. These findings collectively suggest that both online dictionary use and learning motivation exert independent positive effects on English reading comprehension, but their interaction does not produce a synergistic outcome.

Discussion

Effect of Online Dictionary Use on Reading Comprehension

The present study revealed a strong and significant correlation between online dictionary use and English reading comprehension ($r = 0.797$, $p < 0.001$). This finding suggests that frequent use of online dictionaries facilitates vocabulary acquisition and enhances students' ability to construct meaning from texts. Vocabulary knowledge is widely recognized as a core determinant of reading comprehension (Putri

& Refnaldi, 2020; Panjaitan et al., 2024). Online dictionaries provide immediate access to lexical information, including meaning, pronunciation, and contextual usage, which collectively strengthen linguistic competence and reduce comprehension barriers.

These results align with prior evidence indicating that electronic dictionaries improve vocabulary retention and accelerate comprehension by enabling faster and more interactive meaning retrieval (Sarmila et al., 2023). Similarly, Wati (2020) demonstrated that English as a Foreign Language (EFL) learners using electronic dictionaries completed reading tasks more efficiently without compromising comprehension quality. From a cognitive load perspective, appropriate use of digital aids can lower extraneous processing demands, allowing learners to allocate more mental resources to meaning construction (Atiomo, 2020).

However, the benefits of online dictionaries depend on factors such as usage frequency and digital literacy. Without proper reading strategies, dictionary use may become a mechanical activity that disrupts comprehension rather than supports it. As noted by Sarmila et al. (2023), pedagogical guidance is essential to ensure that online dictionaries are integrated into reflective and strategic reading practices. Teachers should encourage students to use digital dictionaries not merely as translation tools, but as active scaffolds for vocabulary learning and comprehension.

Effect of Learning Motivation on Reading Comprehension

A strong positive relationship was also found between learning motivation and English reading comprehension ($r = 0.980$, $p < 0.001$). This indicates that higher motivation levels are closely associated with better reading performance. The finding supports the Self-Determination Theory, which posits that intrinsic motivation enhances engagement, persistence, and deep learning (Wininger & Desena, 2022). Motivated learners perceive reading not as a curricular obligation but as a personally meaningful activity, fostering autonomy and competence.

Consistent with previous studies, highly motivated students tend to employ deeper cognitive and metacognitive strategies such as elaboration, inference, and evaluation, which lead to stronger comprehension outcomes (Permatasari & Wienanda, 2023; Han, 2021). Motivation therefore acts as both a driving and sustaining force in reading development. Nonetheless, reading comprehension remains a multifactorial skill influenced by linguistic, cognitive, and affective components (Alfiani et al., 2024). Motivation alone cannot fully compensate for inadequate vocabulary mastery or poor reading strategies. This finding underscores the importance of holistic instruction that integrates effective engagement with linguistic and strategic training.

In line with Nurhidayah (2020), motivation is a necessary but not sufficient condition for second-language reading success. Teachers must cultivate both intrinsic motivation and cognitive readiness through meaningful reading materials, clear learning goals, and constructive feedback. Such an integrative approach ensures that motivational gains translate into tangible comprehension improvement.

Interaction Between Online Dictionary Use and Learning Motivation

Although both variables exerted significant independent effects on reading comprehension, their interaction was not statistically significant ($p = 0.133$). This implies that the effectiveness of online dictionary use does not vary substantially across different motivation levels. The finding aligns with Klimova and Pikhart (2023), who suggested that electronic dictionaries serve as effective cognitive aids for diverse learner profiles, regardless of their motivational orientation. According to the interactive compensatory model, learners with moderate motivation may still achieve satisfactory comprehension by compensating with efficient cognitive tools such as online dictionaries (Puspita et al., 2020).

The model explained 65.9% of the variance in reading comprehension scores ($R^2 = 0.659$), indicating that the combined influence of cognitive (dictionary use) and affective (motivation) factors accounts for a substantial proportion of students' reading performance. While their interaction was not significant, the independent contributions of each remain meaningful and pedagogically valuable.

These results suggest that English reading instruction should integrate both digital literacy and motivational enhancement strategies. Teachers and curriculum designers are encouraged to provide structured opportunities for students to use online dictionaries effectively while simultaneously fostering intrinsic motivation through engaging materials, learner autonomy, and supportive classroom

environments. By aligning cognitive scaffolding with affective engagement, educators can promote sustained improvement in reading comprehension among EFL learners.

Study Limitations

Despite yielding significant findings, this study has several limitations that should be acknowledged. First, the research employed a quasi-experimental design with non-randomized class assignment, which may limit the generalizability of the results beyond the sampled population. Although both classes were comparable in academic ability and motivation, uncontrolled extraneous variables—such as teacher interaction style or classroom environment—might have influenced the outcomes. Second, the sample was limited to two classes from a single school (SMAN 1 Madiun), which restricts the representativeness of the findings across different educational contexts or proficiency levels. Third, the study relied primarily on quantitative measures, particularly test scores and self-reported questionnaires. While these instruments provided valuable insights into reading comprehension and motivation, they may not fully capture the complexity of learners' cognitive processes or affective engagement during reading activities.

Finally, the short duration of the intervention (approximately 8 weeks of treatment) may not reflect the long-term effects of online dictionary use on reading proficiency. Future research should employ larger, more diverse samples and adopt mixed-method approaches that combine quantitative data with qualitative observations or think-aloud protocols. Longitudinal designs would also help examine the sustained impact of digital tools and motivational dynamics on language learning performance.

CONCLUSIONS

This study demonstrated that the use of online dictionaries significantly enhances students' reading comprehension in English as a foreign language, outperforming conventional learning methods. The strong positive correlation between dictionary use and reading performance indicates that digital lexical tools not only facilitate faster word recognition but also support deeper textual understanding. Furthermore, students with higher learning motivation consistently achieved better reading outcomes, confirming motivation as a crucial affective determinant of language learning success. Although both variables—online dictionary use and learning motivation—independently contributed to improved reading comprehension, their interaction effect was not statistically significant. This suggests that online dictionaries benefit students across different motivational levels, emphasizing their potential as universally effective pedagogical aids. The findings highlight the importance of integrating technology-based vocabulary support and motivation-enhancing strategies into reading instruction. Teachers are encouraged to scaffold students' dictionary use within strategic reading frameworks and to foster sustained motivation through meaningful, student-centered activities. Future studies should expand the research to larger and more diverse populations, employ mixed-method designs, and investigate long-term impacts. By doing so, a more comprehensive understanding of how digital tools and motivational dynamics shape reading development in EFL contexts can be achieved.

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