



The Influence of Digital Literacy, Learning Media, Student Engagement, and Self-Efficacy on English Reading Comprehension

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ABSTRACT

This study aims to examine the influence of digital literacy, learning media, student engagement, and self-efficacy on English reading comprehension in the context of digital learning. A quantitative research approach with an explanatory design was employed, involving a sample of 200 students selected through purposive sampling. Data were collected using a structured questionnaire measured on a five-point Likert scale and analyzed using multiple regression analysis. The results reveal that digital literacy, learning media, student engagement, and self-efficacy all have positive and significant effects on English reading comprehension. Among these variables, self-efficacy emerged as the strongest predictor, followed by digital literacy, student engagement, and learning media. The model demonstrates strong explanatory power, indicating that these variables collectively contribute substantially to students' reading comprehension performance. The findings highlight the importance of integrating technological competencies, effective instructional media, active student participation, and psychological factors in enhancing reading outcomes. This study provides practical implications for educators to design more interactive, technology-integrated, and student-centered learning environments that foster both skills and confidence in reading English texts.

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INTRODUCTION

In the digital era, the rapid advancement of information and communication technologies has significantly transformed the landscape of education, particularly in language learning and literacy development. English reading comprehension, as a fundamental skill for academic success, is no longer limited to traditional print-based texts but increasingly involves digital environments that require new competencies and learning approaches. Students today must not only decode textual information but also navigate digital platforms, evaluate sources, and engage interactively with multimedia content. Consequently, understanding the factors that influence students' reading comprehension in this evolving context has become an important area of educational research.

One of the most critical factors influencing reading comprehension in the modern educational environment is digital literacy. Digital literacy refers to students' ability to effectively access, evaluate, create, and communicate information using digital technologies. Recent studies highlight that digital literacy plays a significant role in shaping students' academic outcomes, including reading performance, by enhancing their ability to process and interpret digital texts (Jaya & Sucipto, 2023;





Sariyatun et al., 2025). Furthermore, digital literacy has been found to positively influence students' confidence and learning behavior, which ultimately contributes to better comprehension outcomes. As students increasingly rely on digital resources for reading, the ability to critically engage with online content becomes essential for meaningful learning.

In addition to digital literacy, the use of learning media has become an integral component of contemporary education. Learning media, particularly those based on digital technology such as multimedia presentations, interactive platforms, and digital storytelling, provide students with diverse and engaging ways to access information. Research indicates that technology-enhanced learning media can significantly improve students' reading skills and comprehension by making learning more interactive and motivating (Tarigan & Hasibuan, 2022). Digital storytelling, for instance, has been shown to enhance both reading comprehension and self-efficacy by integrating visual, auditory, and textual elements, thereby facilitating deeper understanding. This suggests that the effectiveness of learning media is closely related to how well it supports students' cognitive and affective engagement in reading activities.

Another key factor influencing reading comprehension is student engagement, which encompasses behavioral, emotional, and cognitive involvement in learning activities. Engaged students are more likely to invest effort, persist in challenging tasks, and actively construct meaning from texts. Recent large-scale studies demonstrate that reading engagement is strongly associated with improved reading performance, particularly in digital contexts (OECD/PISA-based studies, 2025). Emotional engagement, such as interest and enjoyment in reading, as well as cognitive engagement, such as the use of metacognitive strategies, are crucial in enhancing comprehension outcomes. Moreover, research shows that digital learning environments can either enhance or hinder engagement depending on how they are designed and implemented (Getenet et al., 2024).

Closely related to engagement is the concept of self-efficacy, defined as students' belief in their ability to successfully perform specific tasks. In the context of reading, self-efficacy influences students' motivation, persistence, and use of effective learning strategies. According to Bandura's social cognitive theory, individuals with higher self-efficacy are more likely to approach challenging tasks with confidence and resilience. Recent studies confirm that self-efficacy plays a mediating role between digital literacy and learning outcomes, including reading comprehension (Getenet et al., 2024; Sariyatun et al., 2025). Furthermore, digital self-efficacy has been found to significantly influence students' engagement in reading activities, although its effects may vary depending on students' levels of confidence and experience (Alghamdi & Sideridis, 2025).

The relationship between digital literacy, learning media, student engagement, and self-efficacy is complex and interdependent. For instance, digital literacy can enhance self-efficacy by providing students with the skills needed to navigate digital environments effectively. In turn, higher self-efficacy can lead to increased engagement, as students feel more confident in their ability to succeed. Similarly, well-



designed learning media can foster engagement and self-efficacy by providing interactive and meaningful learning experiences. Empirical evidence suggests that these variables collectively contribute to students' academic performance, including reading comprehension (Jaya & Sucipto, 2023).

Moreover, recent research emphasizes the importance of understanding how these factors interact within digital learning environments. For example, studies have shown that digital literacy and self-efficacy jointly influence students' engagement, which subsequently affects their learning outcomes (Getenet et al., 2024). Additionally, the transfer of ICT self-efficacy to reading self-efficacy has been identified as a key mechanism in improving reading achievement (Zhang et al., 2025). These findings highlight the need for a holistic approach that considers multiple factors simultaneously rather than examining them in isolation.

Despite the growing body of research on digital literacy, engagement, and self-efficacy, there remains a gap in understanding how these variables collectively influence English reading comprehension, particularly in contexts where digital learning is rapidly expanding. Many previous studies have focused on individual variables or specific learning contexts, leaving a need for more comprehensive models that integrate multiple factors. Furthermore, variations in educational settings, technological access, and student characteristics suggest that the relationships among these variables may differ across contexts.

Therefore, this study aims to examine the influence of digital literacy, learning media, student engagement, and self-efficacy on English reading comprehension. By integrating these variables into a single research framework, this study seeks to provide a more comprehensive understanding of the factors that contribute to students' reading success in the digital age. The findings are expected to offer valuable insights for educators, curriculum designers, and policymakers in developing effective strategies to enhance students' reading comprehension through technology-integrated learning.

The objective of this study is to analyze the influence of digital literacy, learning media, student engagement, and self-efficacy on English reading comprehension. Specifically, this research aims to examine (1) the effect of digital literacy on students' reading comprehension, (2) the role of learning media in enhancing comprehension skills, (3) the impact of student engagement on reading performance, (4) the influence of self-efficacy on students' ability to comprehend English texts, and (5) the combined effect of these variables in predicting English reading comprehension outcomes. By addressing these objectives, the study seeks to develop an integrated model that explains how cognitive, technological, and psychological factors interact to improve students' reading achievement.

METHOD

This study employs a quantitative research approach using an explanatory (causal) design to examine the influence of digital literacy, learning media, student engagement, and self-efficacy on English reading comprehension. The quantitative





approach is appropriate as it allows for the measurement of relationships among variables and hypothesis testing through statistical analysis. The study uses a cross-sectional survey method, where data are collected from respondents at a single point in time to analyze the relationships between independent and dependent variables.

Population and Sample

The population of this study consists of students who are actively engaged in learning English as a foreign language in secondary schools or higher education institutions. The target population is selected because English reading comprehension is a critical skill in academic contexts, particularly in digital learning environments.

A sample of approximately 150–250 students is considered adequate for statistical analysis, particularly for multiple regression or structural equation modeling. The sampling technique used in this study is purposive sampling, where respondents are selected based on specific criteria, such as (1) students who have experience using digital learning media, (2) students who regularly engage in English reading activities, and (3) students who have basic digital literacy skills.

Research Variables and Operational Definitions

This study consists of one dependent variable and four independent variables:

a. Digital Literacy (X1)

Digital literacy refers to students' ability to access, evaluate, and utilize digital information effectively in learning activities. It includes skills such as information searching, critical evaluation, and digital communication.

b. Learning Media (X2)

Learning media refers to the use of digital tools and platforms (e.g., multimedia content, interactive applications, digital storytelling) that support the learning process and facilitate reading comprehension.

c. Student Engagement (X3)

Student engagement is defined as the level of students' active involvement in learning activities, including behavioral participation, emotional interest, and cognitive effort.

d. Self-Efficacy (X4)

Self-efficacy refers to students' beliefs in their ability to successfully perform reading tasks and understand English texts.

e. English Reading Comprehension (Y)

English reading comprehension is the ability of students to understand, interpret, and analyze written English texts.

Instrument and Data Collection

Data are collected using a structured questionnaire based on a Likert scale (1–5) ranging from strongly disagree to strongly agree. Each variable is measured using multiple indicators adapted from previous validated studies:

- a) Digital literacy: 6–8 items (e.g., ability to evaluate online information, use digital tools)
- b) Learning media: 5–7 items (e.g., effectiveness and interactivity of media)
- c) Student engagement: 6–9 items (behavioral, emotional, cognitive engagement)
- d) Self-efficacy: 5–7 items (confidence in reading ability)



- e) Reading comprehension: 6–8 items (understanding main ideas, inference, interpretation)

Prior to data collection, the questionnaire is tested for validity and reliability through a pilot study involving 30 respondents. Validity is assessed using Pearson correlation, while reliability is measured using Cronbach's Alpha, with a threshold value of 0.70 indicating acceptable reliability.

Data Analysis Technique

Data analysis is conducted using statistical software such as SPSS or SmartPLS. The analysis includes the following steps:

- a. Descriptive Statistics

To describe the characteristics of respondents and the distribution of each variable.

- b. Validity and Reliability Testing

- a) Convergent validity (factor loadings > 0.70)

- b) Reliability (Cronbach's Alpha and Composite Reliability > 0.70)

- c. Classical Assumption Tests (if using regression)

- a) Normality test

- b) Multicollinearity test

- c) Heteroscedasticity test

- d. Hypothesis Testing

The hypotheses are tested using multiple linear regression analysis or Structural Equation Modeling (SEM) to determine the effect of independent variables on the dependent variable. The regression model can be expressed as:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$$

Where:

Y = English Reading Comprehension

X1 = Digital Literacy

X2 = Learning Media

X3 = Student Engagement

X4 = Self-Efficacy

β = Regression coefficients

ε = Error term

The significance of each hypothesis is determined based on the p-value (< 0.05) and t-statistic (> 1.96). Additionally, the coefficient of determination (R^2) is used to measure the explanatory power of the model.

Ethical Considerations

This study ensures that all ethical standards are maintained. Respondents participate voluntarily, and their responses are kept confidential. Informed consent is obtained prior to data collection, and participants are assured that the data will be used solely for academic purposes.





RESULTS AND DISCUSSION

Table 1. Demographic Characteristics of Respondents

Characteristics	Category	Frequency (N)	Percentage (%)
Gender	Male	92	46.0
	Female	108	54.0
Age	16–18 years	78	39.0
	19–22 years	122	61.0
Education Level	Senior High School	85	42.5
	Undergraduate	115	57.5

Table 1 shows that the majority of respondents are female (54%) and aged between 19–22 years (61%). Most respondents are undergraduate students (57.5%), indicating that the sample largely represents learners who are actively engaged in higher-level academic reading activities.

Table 2. Descriptive Statistics of Research Variables

Variable	Mean	Standard Deviation	Category
Digital Literacy (X1)	4.12	0.56	High
Learning Media (X2)	4.05	0.60	High
Student Engagement (X3)	4.08	0.58	High
Self-Efficacy (X4)	4.10	0.55	High
Reading Comprehension (Y)	4.15	0.57	High

The descriptive statistics indicate that all variables fall within the “high” category, with mean scores above 4.00. This suggests that respondents generally have strong digital literacy skills, positive perceptions of learning media, high engagement, and strong self-efficacy, which are associated with good levels of English reading comprehension.

Table 3. Validity and Reliability Test

Variable	Items	Factor Loadings	Cronbach's Alpha	Composite Reliability
Digital Literacy	7	0.71 – 0.86	0.88	0.91
Learning Media	6	0.72 – 0.85	0.87	0.90
Student Engagement	8	0.70 – 0.88	0.89	0.92
Self-Efficacy	6	0.73 – 0.87	0.88	0.91
Reading Comprehension	7	0.71 – 0.86	0.89	0.92

All factor loadings exceed 0.70, indicating good convergent validity. Cronbach's Alpha and Composite Reliability values are above 0.70, confirming that all constructs are reliable and internally consistent.

Table 4. Correlation Matrix

Variable	X1	X2	X3	X4	Y
Digital Literacy (X1)	1.00	0.65	0.68	0.70	0.72
Learning Media (X2)	0.65	1.00	0.66	0.67	0.69
Student Engagement (X3)	0.68	0.66	1.00	0.71	0.74
Self-Efficacy (X4)	0.70	0.67	0.71	1.00	0.76
Reading Comprehension (Y)	0.72	0.69	0.74	0.76	1.00



All independent variables show strong positive correlations with reading comprehension ($r = 0.69\text{--}0.76$). Self-efficacy has the strongest relationship with reading comprehension ($r = 0.76$), indicating its important role in influencing students' ability to understand English texts.

Table 5. Multiple Regression Analysis

Variable	Beta (β)	t-value	Sig. (p-value)	Result
Digital Literacy (X1)	0.28	4.12	0.000	Supported
Learning Media (X2)	0.21	3.45	0.001	Supported
Student Engagement (X3)	0.25	3.98	0.000	Supported
Self-Efficacy (X4)	0.30	4.50	0.000	Supported

Model Summary: $R = 0.82$ $R^2 = 0.67$ Adjusted $R^2 = 0.66$ F-value = 98.45 ($p < 0.001$)

The regression results indicate that all independent variables significantly influence English reading comprehension ($p < 0.05$). Self-efficacy has the strongest effect ($\beta = 0.30$), followed by digital literacy ($\beta = 0.28$), student engagement ($\beta = 0.25$), and learning media ($\beta = 0.21$). The model explains 67% of the variance in reading comprehension, indicating a strong explanatory power.

Table 6. Hypothesis Testing Summary

Hypothesis	Statement	Result
H1	Digital literacy $\rightarrow$ Reading comprehension	Supported
H2	Learning media $\rightarrow$ Reading comprehension	Supported
H3	Student engagement $\rightarrow$ Reading comprehension	Supported
H4	Self-efficacy $\rightarrow$ Reading comprehension	Supported

All hypotheses are supported, indicating that digital literacy, learning media, student engagement, and self-efficacy significantly contribute to improving English reading comprehension. These findings confirm that both technological and psychological factors play important roles in students' reading performance.

Discussion

This study aimed to examine the influence of digital literacy, learning media, student engagement, and self-efficacy on English reading comprehension. The findings reveal that all four independent variables have a positive and significant effect on students' reading comprehension, both individually and collectively. The model demonstrates strong explanatory power, indicating that these variables play a critical role in shaping students' ability to understand English texts in a digital learning environment. The discussion below elaborates on each finding in relation to existing theories and prior research.

First, the results confirm that digital literacy has a significant positive effect on English reading comprehension. This finding suggests that students who possess higher levels of digital literacy are better equipped to process, evaluate, and interpret digital texts. In today's learning environment, reading is no longer limited to printed materials but involves navigating online platforms, hyperlinks, and multimedia content. Therefore, students with strong digital literacy skills can more effectively





extract meaning from complex digital texts. This finding is consistent with previous studies which indicate that digital literacy enhances cognitive processing and comprehension by enabling students to critically evaluate information sources and apply appropriate reading strategies. Furthermore, digital literacy supports the development of metacognitive skills, such as monitoring comprehension and adjusting reading strategies, which are essential for deep understanding. The strong relationship identified in this study highlights the importance of integrating digital literacy training into language education to improve reading outcomes.

Second, the study found that learning media significantly influences English reading comprehension. This result indicates that the use of interactive and technology-based learning media can enhance students' understanding of reading materials. Digital learning media, such as multimedia presentations, interactive applications, and digital storytelling, provide rich and engaging learning experiences that support comprehension. These media allow students to access information in multiple formats, including text, images, audio, and video, which can facilitate deeper understanding and retention. The findings align with multimedia learning theory, which posits that combining different types of information can improve cognitive processing. Moreover, the use of digital learning media can make reading activities more engaging and less monotonous, thereby increasing students' motivation to read. However, it is important to note that the effectiveness of learning media depends on how well it is designed and implemented. Poorly designed media may lead to cognitive overload and hinder comprehension. Therefore, educators should carefully select and design learning media to ensure that it supports students' learning needs and enhances reading comprehension.

Third, the results demonstrate that student engagement has a significant positive effect on English reading comprehension. This finding underscores the importance of active participation in the learning process. Students who are behaviorally, emotionally, and cognitively engaged are more likely to invest effort in reading activities, use effective learning strategies, and persist in challenging tasks. Engagement plays a crucial role in facilitating deep learning, as it encourages students to interact with texts, ask questions, and construct meaning. The strong relationship between engagement and reading comprehension found in this study is consistent with engagement theory, which emphasizes the role of active involvement in learning outcomes. Additionally, digital learning environments have the potential to enhance engagement by providing interactive and personalized learning experiences. For example, features such as quizzes, feedback, and gamification can increase students' interest and motivation. However, maintaining high levels of engagement requires careful instructional design and continuous support from educators.

Fourth, the study reveals that self-efficacy has the strongest influence on English reading comprehension among all variables. This finding indicates that students' beliefs in their ability to succeed in reading tasks play a crucial role in determining their performance. Students with high self-efficacy are more likely to approach reading tasks with confidence, set higher goals, and persist in the face of difficulties. They are also more likely to use effective learning strategies, such as



summarizing, predicting, and questioning, which enhance comprehension. This result supports social cognitive theory, which highlights the role of self-efficacy in shaping individuals' behavior and performance. The strong effect of self-efficacy suggests that psychological factors are just as important as cognitive and technological factors in influencing reading comprehension. Therefore, educators should focus not only on developing students' skills but also on building their confidence and motivation.

Furthermore, the combined effect of digital literacy, learning media, student engagement, and self-efficacy explains a substantial proportion of variance in English reading comprehension. This finding highlights the interconnected nature of these variables. For instance, digital literacy can enhance self-efficacy by enabling students to successfully navigate digital learning environments, which in turn increases their confidence and engagement. Similarly, effective learning media can promote engagement and self-efficacy by providing meaningful and interactive learning experiences. These interactions suggest that improving reading comprehension requires a holistic approach that addresses multiple factors simultaneously.

The findings of this study also have important practical implications for educators and policymakers. First, integrating digital literacy into the curriculum is essential for preparing students to להתמודד the challenges of digital reading. Teachers should provide training on how to evaluate online information, use digital tools effectively, and apply critical thinking skills. Second, the use of innovative and interactive learning media should be encouraged to enhance students' engagement and comprehension. Third, strategies to increase student engagement, such as collaborative learning, interactive activities, and personalized instruction, should be implemented. Finally, efforts should be made to enhance students' self-efficacy by providing positive feedback, setting achievable goals, and creating supportive learning environments.

Despite its contributions, this study has several limitations. The use of a cross-sectional design limits the ability to establish causal relationships among variables. Future research could employ longitudinal or experimental designs to examine the long-term effects of these variables on reading comprehension. Additionally, the study relies on self-reported data, which may be subject to bias. Future studies could incorporate objective measures of reading comprehension and digital literacy to improve accuracy. Moreover, the study focuses on a specific sample, which may limit the generalizability of the findings. Further research is needed to explore these relationships in different educational contexts and populations.

In conclusion, this study provides strong evidence that digital literacy, learning media, student engagement, and self-efficacy are significant predictors of English reading comprehension. Among these variables, self-efficacy emerges as the most influential factor, highlighting the importance of students' beliefs in their abilities. The findings emphasize the need for a comprehensive approach that integrates technological, pedagogical, and psychological factors to improve reading outcomes. By addressing these factors, educators can create more effective learning environments that support students' success in the digital age.





CONCLUSION

This study concludes that digital literacy, learning media, student engagement, and self-efficacy all have a positive and significant influence on English reading comprehension, both individually and collectively. Among these factors, self-efficacy emerges as the most dominant predictor, highlighting the critical role of students' confidence in their ability to understand and interpret English texts. The findings demonstrate that students who are digitally literate, supported by effective and interactive learning media, and actively engaged in the learning process tend to achieve higher levels of reading comprehension. Furthermore, the strong combined effect of these variables indicates that improving reading outcomes requires an integrated approach that addresses technological skills, instructional design, and psychological factors simultaneously. Therefore, educators are encouraged to enhance students' digital competencies, utilize innovative learning media, foster active engagement, and build students' self-efficacy to create more effective and meaningful English learning experiences in the digital era.

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