

Relationship of AI- Dependency and Reading Comprehension of Pre-Service English Teachers

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Abstract

With the increasing integration of Artificial Intelligence (AI) tools in academic settings, this research aims to determine how AI usage influences students' reading comprehension skills. This quantitative study investigates the relationship between reading comprehension and AI dependency among pre-service English Teachers at Central Bicol State University of Agriculture. The study found that first-year students had below-average reading comprehension. In contrast, second-year to fourth-year students demonstrated average comprehension, indicating improvement over time but with room for growth. It revealed moderate AI dependency across all year levels, with third-year students showing the highest reliance on AI for academic purposes. A weak positive correlation between reading comprehension and AI dependency was observed, though not statistically significant, suggesting that AI use alone does not directly affect reading comprehension. The results imply that effective reading comprehension skills does not depend on AI usage, and the importance of critical thinking methods should be emphasized

Keywords: *artificial intelligence, reading comprehension, AI dependency, pre-service English teachers*

Background

Reading Comprehension is the process of understanding a certain text. It requires the readers to be actively engaged in reading. One can comprehend through the combination of decoding and language fluency (Barowski et.al, 2023). Comprehension could lead to conceptual understanding (Basagre, 2023), which most students lack in the 21st century. Without comprehension, readers gain no meaning from what they read. According to the study of Clarke et al (2014), the difficulties experienced by readers with poor comprehension usually start at the age of eight, when the mechanics of reading are secured. It is true that as children transfer to secondary education, the emphasis is placed on 'reading to learning', and subject areas may lead to difficulties for readers with poor comprehension across the curriculum. For that reason, Clarke et al (2014) believed that poor comprehension readers need extra support during primary school to prevent negative outcomes over time.

The study by Abbas (2016) emphasizes that reading strategies significantly impact students' reading comprehension. It highlights that successful readers actively engage with texts using various strategies to construct meaning, and materials should be engaging and appropriate for students' proficiency levels to enhance comprehension. Artificial Intelligence (AI) also plays a significant role in students' reading comprehension by offering personalized, interactive, and accessible learning experiences. As Cheol-Seung (2024) notes, AI has the potential to revolutionize educational practices, prompting further innovation and research in its application.

AI simulates human intelligence processes and includes tasks like visual perception, speech recognition, and language translation. Since its formal inception in 1956 at the Dartmouth Conference, AI has evolved from symbolic approaches to expert systems that mimic human cognition, although challenges with uncertainty and ambiguity remain. Common AI tools like ChatGPT and Grammarly are used by students to enhance reading and

writing. ChatGPT aids in sentence formation and word meanings, while Grammarly assists with proofreading, paraphrasing, and grammar checks, offering valuable support in academic tasks.

The study by Hidayat (2024) highlights the effectiveness of AI-based personalized reading platforms in improving reading comprehension among senior high school students. The results suggest that integrating these platforms into teaching strategies could enhance students' reading skills by offering individualized reading materials and feedback tailored to their needs. Additionally, AI learning tools have been shown to improve reading comprehension across various age groups and disciplines. For example, Liu et al. (2020) demonstrated that a specific AI program helped Chinese students better understand what they read, while Iwata et al. (2020) found that AI feedback on writing assignments also enhanced reading comprehension. These tools personalize learning by providing appropriate materials and feedback to meet students' unique needs.

Nugrahawati (2024) states that AI helps empower teachers by making learning more engaging for students and supports both school and self-learning. In the future, AI will play a larger role in presenting materials, conducting assessments, and providing feedback across educational platforms. In 2024, Karina et al. highlight AI's growth in education, particularly in supporting pre-service English teachers. The study found that AI improved teaching strategies, efficiency, resources, and preparation. However, challenges such as alignment issues and cultural biases remain.

The study of AI in education addresses critical concerns like data privacy, algorithmic bias, and the potential for over-reliance on technology, which must be managed to ensure equitable access and fair practices (Baker, 2000). As AI tools advance, they present opportunities to enhance reading comprehension and personalize learning. However, ethical and practical challenges must be carefully considered. AI's impact also extends to library services, with recommendation systems helping users efficiently find books and resources aligned with their interests and research needs (Chen et al., 2020).

Most pre-service teachers tend to prefer the use of artificial intelligence-enabled tools rather than traditional approaches when it comes to learning. They embrace flexibility, immediate feedback, and interactive interfaces provided by such systems. However, over-reliance on artificial intelligence may have negative implications on the development of a learner's independent thought, creative problem-solving skills, and comprehension since learners are likely to over-rely on artificial intelligence solutions that deliver answers instead of taking a commitment to the actual learning process.

The study focused on the relationship between reading comprehension and AI-dependency of pre-service English Teachers. As technology plays a significant role in most people's lives, and AI is becoming a central part of education, it is essential to understand how AI tools are impacting students' learning, particularly their ability to comprehend text, which is a foundational skill necessary in all academic disciplines.

Research Method

Research Design

This is a descriptive-correlational study. The descriptive-correlational design allows for the exploration of the level of dependency on AI among pre-service English teachers and its relationship with reading comprehension proficiency. It focuses at the variables without manipulating them to identify possible relationships. Moreover, survey questionnaires and reading comprehension tests were used to collect and gather data and information in order to come up with the possible recommendations that can be made to know the level of their dependency on artificial intelligence to their reading comprehension in the said target students.

Research Instruments

The two kinds of instrument used in this research are AI dependency survey scale and reading comprehension test.

AI Dependency test

It is an AI Dependency Survey Scale that determines the dependency of the respondents on AI by questions regarding how frequently respondents used AI tools, perceived benefits and drawbacks of AI in their learning

process, and whether they depended on AI to accomplish academic reading tasks. Each item's response is converted into quantitative data. The information is evaluated by arithmetic methods.

The scale that follows each item is called Likert scale. According to Tuckman (1972), a Likert scale has a five points scale where it is assumed that the distance between each point on the scale is equal. An equal seeming interval scale is the true name for it. This scale is employed to indicate how much one agrees or disagrees with a specific phrase of a mindset, conviction, or assessment.

To demonstrate their mindset, the respondents select one of the five options toward the object that was presented to them. The questionnaire's score is established by adding up the points allotted to each response. In order to calculate the rate, from a positive to a negative response, each item receives a credit of 5, 4, 3, 2, or 1. The response choices, on the other hand, are credited 1, 2, 3, 4, or 5 from unfavorable to positive response.

Table 1: AI Dependency Interpretation

Percentage (%)	Verbal Interpretation
0 % - 20 %	Less Dependent
21 % - 40 %	Moderately Dependent
41 % - 60 %	Dependent
61 % - 80 %	Slightly Dependent
81 % - 100 %	Highly Dependent

Reading Comprehension Test

This study examines whether pre-service English teachers could effectively comprehend what they read. The reading comprehension test is employed to find out how well the pre-service English teachers, as respondents, can understand the material read. The test consisted of 9 different passages with questions that forced the respondents to reflect on what they had read differently. The researchers analyzed the test scores to see the reading abilities of the respondents.

It is a standardized reading comprehension test designed by Curtis (1983) to assess the reading comprehension of the respondents using passages with various difficulty levels and comprehension questions. The respondents read 9 passages in a 40-item multiple choice test and answered by choosing the best answer accordingly.

Table 2: Reading Comprehension Interpretation

Score	Percentage (%)	Percentage (%)
0 - 6	0 % - 20 %	Low Comprehension
7 - 12	21 % - 40 %	Below Average Comprehension
13 - 18	41 % - 60 %	Average Comprehension
19 - 25	61 % - 80 %	Above Average Comprehension
26 - 30	81 % - 100 %	High Comprehension

Respondents

Stratified random sampling technique using Proportional Allocation was used in this study. By using Slovin's formula, the number of respondents was determined. The respondents for this study were the sixty-four (64) pre-service English teachers, randomly selected from sixteen (16) respondents per year level (1st, 2nd, 3rd, and 4th year) of the program at CBSUA.

Table 3: Respondents of the Study

Population	Sample	Distribution	
		Year Level	<i>f</i>
182	64	1 st year	16
		2 nd year	16
		3 rd year	16
		4 th year	16

Statistical Treatment of Data

After the researchers gathered all the information, they carefully arranged it, putting it into tables and categories. Researchers subjected said figures and details to statistical treatment to answer the questions proposed in the study. The following statistical tools are used in the analysis of data. The **percentage** is used to determine the proportion of distribution of respondents in each group. After gathering the data, the researchers used this formula to determine the level of Reading Comprehension of pre-service English teachers. This will show the distribution of pre-service English teachers to different levels of Reading Comprehension. Using an AI Dependency Survey Questionnaire, the **mean** represents the average AI dependency level of pre-service English majors. **Pearson product-moment correlation coefficient** attempts to draw a line of best fit through the data of two variables, and the Pearson correlation coefficient, r , indicates how far away all these data points are to this line of best fit. The researchers will use the Pearson correlation coefficient to show how much the independent variable affects the dependent variable and whether the correlation is positive or negative. In this study, the independent variable is the reading comprehension, while the dependent variable is the AI dependency of the pre-service English Majors.

Result and Discussion

Level of Reading Comprehension of Pre-service English teachers

This table presents the reading comprehension performance of the Pre-service English majors across the different year levels. The results indicate that first-year students got a below-average comprehension level, ($M = 12.13$; $SD = 6.25$). In contrast, the second year ($M = 13.44$; $SD = 6.98$), third year ($M = 13.63$; $SD = 7.96$), and the fourth-year ($M = 16.94$; $SD = 9.09$). The overall reading comprehension level is classified as average (46.77%). This implies that while students demonstrate a reasonable ability to understand written texts, there remains room for improvement, particularly for lower-year students.

Table 4. Reading Comprehension Results

Year Level	Mean	Percentage (%)	Verbal Interpretation
1 st year	12.13	40.42	Below Average
2 nd year	13.44	44.79	Average
3 rd year	13.63	45.42	Average
4 th year	16.94	56.46	Average
Overall	14.03	46.77	Average

According to Snow (2002), reading comprehension is not merely about decoding words but involves constructing meaning through interaction with the text, prior knowledge, and contextual understanding. Therefore, intervention strategies such as reading workshops, comprehension strategy instruction, and increased engagement with diverse text genres may help enhance students' reading proficiency. Furthermore, the variation in reading comprehension levels among different year levels underscores the importance of developing scaffolded instruction tailored to students' needs. Studies by Kintsch (1998) and Paris & Hamilton (2009) emphasize that comprehension improvement is closely linked to instructional support, such as guided reading practices and the integration of cognitive strategies like summarization, questioning, and visualization which in turn could satisfy students in the curriculum when they graduated (Basagre, 2024).

Implications for AI Dependency and Reading Development

As technology continues to shape educational experiences, AI-powered tools such as language models, digital reading assistants, and adaptive learning platforms play a crucial role in students' reading development. However, studies indicate that an overreliance on AI-generated summaries and interpretations may hinder students' ability to develop independent critical reading skills (Coiro & Dobler, 2007). To sum up, the overall average comprehension level indicates a need for targeted interventions to enhance reading skills, particularly in lower-year levels. Incorporating reading comprehension strategies, metacognitive skills training, and responsible AI use in academic reading may contribute to improved reading proficiency among pre-service English teachers.

Level of AI Dependency of Pre-service English Teachers

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This table shows the AI dependency results that pre-service English teachers across all year levels are moderately dependent on AI tools for academic purposes.

Table 5. AI Dependency Results

Year Level	Mean	Percentage (%)	Verbal Interpretation
1 st year	2.8875	57.75	Dependent
2 nd year	2.575	51.5	Dependent
3 rd year	2.9875	59.75	Dependent
4 th year	2.7875	55.75	Dependent
Overall	2.809375	56.19	Dependent

The first-year students show a dependent level with a mean score of 2.89 (57.75%), ($M = 2.8875$; $SD = 0.74$), which suggests that AI tools are already being utilized in their early academic journey. Similarly, second-year ($M = 2.575$; $SD = 0.83$), third-year ($M = 2.9875$; $SD = 0.64$), and fourth-year ($M = 2.7875$; $SD = 1.01$) students demonstrate a dependent reliance on AI, with the third-year level having the highest percentage. The overall dependency level is 56.19%, which suggests that AI is an integral part of their learning; it is not yet a dominant factor in their reading comprehension development. However, increasing reliance on AI tools raises questions about their potential impact on students' independent reading and critical thinking skills. The table shows that pre-service English teachers across all year levels are moderately dependent on AI tools for academic purposes, with third-year students exhibiting the highest reliance.

Relationship Between Students' Reading Comprehension and AI Dependency

Initial Comparability

In choosing to analyze the data using Pearson's correlation, part of the process involves checking to make sure that the data to be analyzed can be examined using Pearson's correlation. This is essential because it is only appropriate to use Pearson's correlation if the data passes the four assumptions that are required for Pearson's correlation to give a valid result.

Table 6. Shapiro-Wilk test

	Reading Comprehension	AI Dependency
N	64	64
Mean	14.03	2.81
Median	11.50	2.80
Standard Deviation	7.67	0.81
Shapiro-Wilk W	0.89	0.97

To assess the normality of data, the researchers used the Shapiro-Wilk test. The Shapiro-Wilk test is a statistical test that assesses the normality of a distribution. It compares the data to a normal distribution and provides a p-value. If the p-value is greater than 0.05, it is assumed that the data is normally distributed. If the p-value is less than 0.05, researchers reject the normality assumption. In this case, for reading comprehension, the Shapiro-Wilk W statistic is 0.89, and for AI Dependency it is 0.97. Therefore, it can be concluded that the distribution of reading comprehension scores and AI dependency survey results is not significantly different from a normal distribution. The normality of the data supports the use of Pearson's correlation for analyzing the relationship between reading comprehension and AI dependency. This is because Pearson's correlation assumes that the data is normally distributed. The Shapiro-Wilk test results provide evidence that this assumption is met for the data, allowing the researchers to proceed with the correlation analysis with confidence.

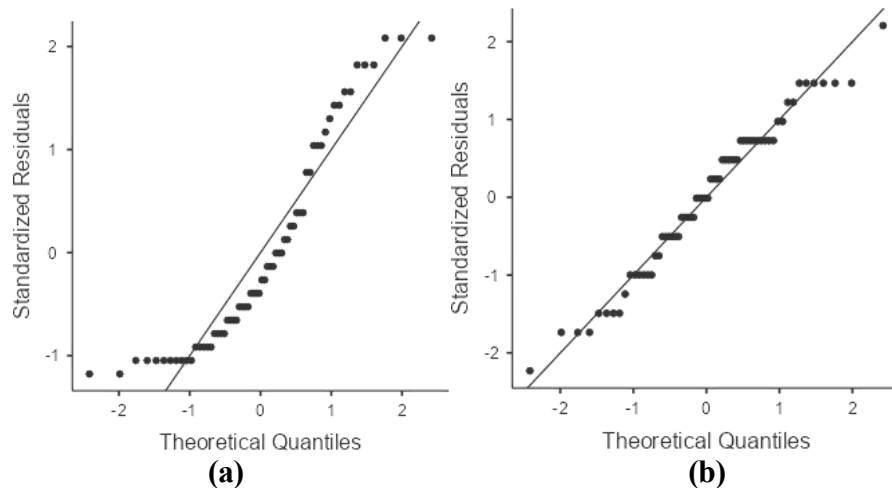


Figure 1. Q-Q Plot of (a) Reading Comprehension, (b) AI dependency

To visually assess the normality of the data, the researchers created Q-Q plots for both reading comprehension and AI dependency (Figure 1 and Figure 2). Based on the Q-Q plot, there are no significant outliers on the data from the Reading comprehension test result and the AI dependency survey result.

Correlation of Reading Comprehension and AI Dependency of Pre-Service English Teachers

The table illustrates the relationship between reading Comprehension and AI dependency among pre-service English teachers.

Table 7. Correlation of Reading Comprehension and AI dependency

	Pearson's r	P value
<i>Reading Comprehension and AI Dependency</i>	0.16	0.199

The Pearson r-value of 0.16 suggests a weak positive correlation between the two variables, meaning that as AI dependency increases, there is a slight tendency for reading comprehension to improve, though the relationship is not strong. The p-value of 0.199 indicates that the correlation is not statistically significant, implying that AI dependency does not have a clear or direct impact, whether positive or negative, on reading comprehension levels. The results indicate that some students who frequently use AI are not. The same applies to students who use AI less; some are good readers, and others are average. It implies that how well one reads depends on more than merely how much they utilize AI.

Reading well requires a solid foundation of standard reading skills, such as comprehending how words interact with each other. Further, students who have spent more time in their academic endeavors tend to read better, even though they utilize AI a lot. The study implies that AI can be utilized as a device to help, but one has to ensure students are taught the traditional methods of reading well and how to think critically and learn by themselves (Baker, 2020; Chen et al., 2011).

The results suggest that while AI usage might contribute to some improvements in reading comprehension, other factors play a more significant role. These factors might include traditional reading strategies, academic experience, and engagement with text-based materials. The weak, non-significant correlation suggests that simply using AI tools does not guarantee improved reading comprehension skills.

The results of the present study, a weak, non-significant positive relationship between AI dependency and reading comprehension, are in line with earlier studies since they noted an intricate nexus among AI usage, conventional learning, and the acquisition of critical thinking (Baker, 2020; Chen et al., 2020).

Baker (2000) highlighted the imperative necessity for educators to respond to issues like data privacy, bias in algorithms, and excessive dependency on technology to facilitate equal access and just educational practices. Chen et al. (2020) also investigated how AI recommendation systems in libraries can improve user experience, but underlined the necessity of preserving critical thinking capabilities when using these systems. These studies, as well as the present one, indicate that although AI instruments can be used to assist with learning, they must not entirely substitute conventional forms of teaching reading comprehension. Dependent use of AI can thwart students' attainment of independent reading skills and analytical thinking skills. Thus, balanced implementation of AI in the classroom is essential for students to achieve both conventional reading skills and competencies in employing AI instruments skillfully and ethically.

Conclusion and Suggestion

The research found that first-year pre-service English teachers had below-average reading comprehension, while upperclassmen students showed an average comprehension level. In the AI dependency of the pre-service English teachers, from first to fourth year, it was found that they are moderately dependent on using AI-generated tools. Based on the aforementioned findings of the study, it could be concluded that the use of AI tools alone does not affect and guarantee improvement in the reading comprehension of the pre-service English teachers; thus, other factors such as reading strategies, academic experience, and engagement to text-based materials must be explored.

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