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Digital Literacy and Reading Habits: Implications to the Pre-service Teachers' Comprehension Skills

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Abstract

In today's digital age, the relationship between digital literacy, reading habits, and comprehension skills has become increasingly crucial in teacher education. This study investigated the implications of digital literacy and reading habits on pre-service teachers' reading comprehension skills at a Catholic school in Cagayan de Oro City. Anchored on Anderson's Schema Theory (1978) and Giroux and Willistin's List of Comprehension Skills (1994), the research aimed to determine digital literacy levels, assess reading habits, evaluate reading comprehension abilities, and examine the relationships between these variables. Employing a descriptive-correlational design, the study collected data from 56 third- and fourth-year pre-service teachers using systematic random sampling. Data were gathered through a digital literacy self-assessment survey, reading habits questionnaire, and reading comprehension test, with findings analyzed using descriptive statistics and Pearson correlation. The results revealed that pre-service teachers demonstrated strong digital literacy across all dimensions, particularly in digital competence, with some limitations in troubleshooting skills. Their reading habits showed positive patterns in motivation but moderate consistency in frequency and duration. Reading comprehension levels were generally strong, with particular strengths in drawing conclusions and isolating details, though concept retention needed improvement. Correlation analysis revealed significant positive relationships between digital competence and all reading dimensions, while digital use and transformation showed more selective associations. These findings point out that teacher education programs prioritize developing integrated frameworks that simultaneously enhance digital competence and reading comprehension skills while fostering sustainable reading habits among pre-service teachers.

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Introduction

English is one of the widely recognized languages globally, acting as a lingua franca in numerous fields such as academic pursuits and economic advancements. With the rapid growth of globalization, an individual's ability to communicate in an effective manner in English has become vital. As Moyo et al. (2023) stated, mastering the "macro skills" or the four vital competencies namely: listening, speaking, reading, and writing, is necessary for language acquisition. Among the four macro skills, reading plays an important role in language learning compared to the rest, as it provides extensive linguistic input, and essential language elements and information which is needed for developing other language skills, including listening, speaking, and writing (Januarty & Nima, 2018; Sasalia and Sari, 2020; Yurko et al., 2020).

Reading is more than just decoding written symbols; it involves a complex cognitive process of understanding and analyzing words and texts to derive meaning (Septiyana et al., 2021). According to Kaganang (2019), reading also serves as a means of communication, knowledge acquisition, and language development, offering learners a foundation for cognitive and linguistic growth. Beyond linguistic benefits, reading further enhances critical thinking, emotional intelligence, self-expression, and creativity (Vijayalakshmi, 2020; Uzumu et al., 2021). However as per Daulay et al. (2023), the true value of reading lies in comprehension which is having the skill to not only decode text but also understand and probe its meaning.

Reading comprehension is influenced by various factors. Some of these factors include text content, individual attitudes and reading habits (Balqi, 2022; Nisak, 2023). Banditvilai (2020), in their study stated that strategies such as skimming, scanning, and questioning are effective in enhancing comprehension, however, they also emphasized that the aforementioned strategies but must be adapted to one's individual needs and material characteristics. Additionally, reading habits, which are unchanging patterns of reading behavior, also has a big influence in developing comprehension skills. Habits such as diverse material selection, frequent reading, and active engagement significantly affect one's cognitive development and overall learning (Dukare et al., 2023).

In the 21st century, the rise of digital technologies has not only introduced new enhancements to the field of education, but has also brought in new dimensions to reading. Digital literacy which is the aptitude to analyze, navigate, and evaluate presented digital information, is now a significant layer of traditional literacy (Reinders, 2022). Due to the shift from print to digital media, learners are now trained to be equipped with the following skills: synthesizing information, adapting to new formats, evaluating credibility. For pre-service teachers, developing these competencies is necessary as they are the ones preparing to equip future generations with the crucial skills in order to thrive in a highly digitalized world.

This intersection of reading habits, comprehension, and digital literacy is seen as significant and crucial in education. This is due to the fact that having merging traditional and digital literacy practices not only develops individual learning outcomes but also societal progress. As globalization continuously transform traditional educational systems, pre-service teachers must gain expertise in these evolving skills to not only model them but

to also teach them effectively to their students.

In conclusion, this study examines the relationship between reading habits, comprehension, and digital literacy, focusing on their collective impact on pre-service teachers' preparedness to navigate and shape the evolving educational landscape. By exploring these interconnected factors, the research seeks to highlight strategies for fostering comprehensive literacy skills, ultimately contributing to the broader goal of lifelong learning and educational equity in a rapidly changing world.

Framework

This study investigated the relationship between digital literacy, reading habits, and reading comprehension skills among pre-service teachers. It is anchored on the Schema Theory of Richard Anderson (1978), which assumes that comprehension is an interaction between prior knowledge and new information. This theory emphasizes that mental frameworks, or schemata, allow individuals to interpret and integrate new information effectively.

Digital literacy, as an independent variable, encompassing digital competence, usage, and transformation, plays a pivotal role in fostering these mental models. It involves critical assessment, effective integration of digital tools, and adaptability to technological changes. For example, the ability to navigate and evaluate digital texts is increasingly essential in modern education, as digital formats often require different strategies compared to traditional reading. Similarly, reading habits, another independent variable, with three domains such as frequency, duration, and motivation, significantly influence comprehension skills. Frequent reading develops cognitive engagement and retention, while extended reading durations foster deeper understanding and the ability to organize information cohesively. Motivation drives the willingness to read and impacts the development of skills like inference-making and drawing conclusions (see Figure 1).

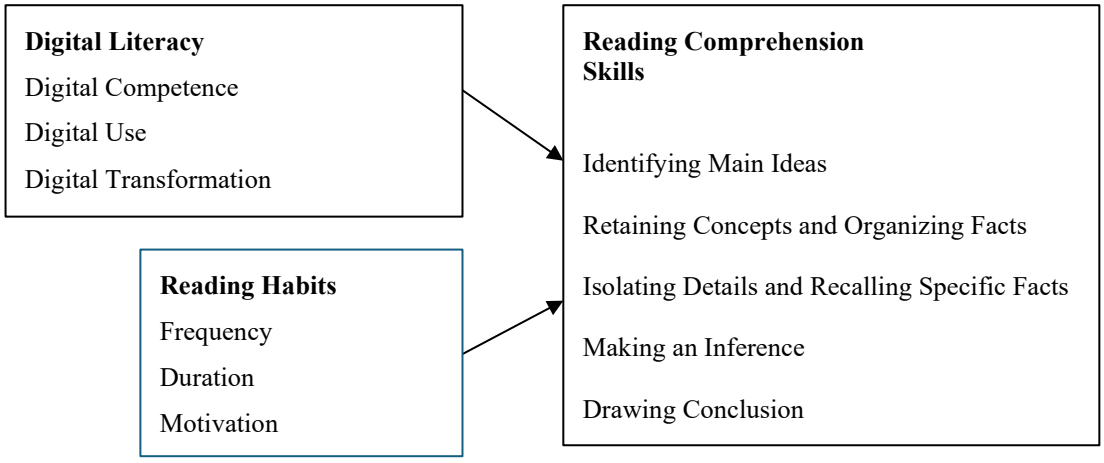

Figure 1. Schematic Diagram of the Study Showing the Interplay of the Variables

Additionally, the study incorporated Giroux and Willistin's (1994) list of comprehension skills, including identifying main ideas, retaining concepts, isolating details, making inferences, and drawing conclusions. These skills provide a foundational framework to measure the impact of digital literacy and reading habits on

comprehension. This framework underscores the synergy between traditional and digital literacy skills in shaping pre-service teachers' academic success and professional preparedness. The figure below presents the interplay of these variables such as reading exposure, use of metacognitive and reading strategies (independent variables), and comprehension skills of grade 9 learners (dependent variable).

Method

Research Type and Design

The study used a descriptive–correlational research design. This design aimed to describe and determine the relationship between the pre-service teachers' reading habits, digital literacy, and reading comprehension skills. In this design, the variables were measured as they naturally existed without manipulation. The descriptive aspect focused on identifying the levels of digital literacy, reading habits, and reading comprehension, while the correlational aspect examined the relationships among these variables using statistical analysis.

Population and Sampling

The participants of the study were third- and fourth-year pre-service teachers enrolled in the Teacher Education Program. The researchers employed systematic random sampling to select 56 participants from the population. In this procedure, every nth individual in a randomly ordered list was chosen, ensuring that all eligible members had an equal chance of selection. This sampling approach provided a representative sample and enhanced the reliability of the study results.

Instrumentation

Digital Literacy Self-Assessment Survey

A digital literacy self-assessment survey was used to assess the level of competency in digital tools among pre-service teachers. Likert-scale questions were used in the survey to assess respondents' digital literacy, usage frequency, and capacity to adjust to new technology in the classroom.

Reading Habits Questionnaire

A reading habits questionnaire was developed to collect information on pre service teachers' reading habits. This instrument measured the frequency, duration, and motivation behind their reading activities, with questions structured 47 as multiple-choice and Likert-scale items. The focus was on both academic and leisure purposes.

Reading Comprehension Test

A reading comprehension test was designed in order to measure reading comprehension among pre-service teachers. Reading passages were included in the test, followed by multiple-choice and short-answer open-ended questions, which were then graded based on the scoring procedure. The purpose of these questions was to assess

the pre-service teachers' comprehension and their ability to identify main ideas, recall specific facts, make inferences, and draw conclusions.

Data Collection and Analysis Procedure

Data were collected through a face-to-face survey, during which the researchers distributed the checklist questionnaires and explained the importance of honest responses, ensuring that ethical principles such as respect for persons, beneficence, and justice were observed throughout the study. For data analysis, the researchers used Descriptive Statistics and Inferential Statistics using Regression Analysis. Descriptive statistics (mean, frequency, standard deviation) were used to determine the levels of digital literacy, reading habits, and reading comprehension, while Pearson correlation was employed to examine how digital literacy and reading habits were associated with reading comprehension skills.

Results

The following tables present the results of analysis of the relationships between digital literacy, reading habits and reading comprehension skills among pre-service teachers. Table 1 presents a summary of pre-service teachers' digital literacy skills across three levels. The analysis highlights a consistently high level of proficiency across all areas. These findings underscore the effectiveness of current teacher education programs in equipping future educators for technology integration while identifying opportunities for targeted improvement.

Table 1. Summary Table of Digital Literacy Level

Dimensions of Digital Literacy Levels	Mean	Interpretation	SD
Digital Competence	4.32	Highly Competent	.428
Digital Use	4.25	Highly Competent	.564
Digital Transformation	4.49	Highly Competent	.493
Overall Digital Literacy Levels	**4.35**	**Highly Competent**	**.495**

For digital competence, pre-service teachers demonstrated highly competent levels, with an overall mean score of 4.32 (SD = 0.428). The majority of respondents were categorized as "Highly Competent" and none showing low or very low competence. This finding aligns with what Cabero et al. (2020) described on their study on the growing adaptability of pre-service teachers to digital demands. Such high levels of competence signify that teacher education programs are successfully preparing educators for technological integration in the workplace. However, in order to further enhance targeted competencies under this domain, programs could incorporate lessons on evaluating online sources, hands-on technical workshops, and etc.

In digital use, pre-service teachers also displayed high levels of competency, with an overall mean score of 4.25 (SD = 0.564), wherein a majority were only either classified as "Highly Competent" or "Competent". The following result is in congruence with Gutiérrez-Ángel et al.'s (2022) findings on their article on the integration of digital tools in teacher programs. In their study, they discovered that although pre-service teachers effectively

utilize basic digital tools, opportunities for improvement in advance practices can still be tapped. With this, programs are recommended on providing training in areas which focus on interactive platform usage and student engagement analytics to enhance the pre-service teachers' data-informed teaching strategies.

Lastly, in the domain of digital transformation, pre-service teachers exhibited the highest competency levels among the three domains, with a mean score of 4.49 (SD = 0.493), as a vast majority of respondents were "Highly Competent" and none displaying moderate or very low levels. These findings corroborate with Stella et al.'s (2022) emphasis on the centrality of digital transformation in education. From the findings, it was discovered that while pre-service teachers are both aware of and receptive to technological integration, there is still a need to improve their leadership skills in this domain. For teacher education programs, incorporating trainings that are leadership-focused could empower pre-service teachers and future educators to pioneer and manage technology-driven initiatives effectively.

In conclusion, while pre-service teachers exhibit high overall competency in the three levels of digital literacy, teacher education programs should prioritize tailored strategies and interventions to bridge specific proficiency gaps. By creating specialized trainings, these programs can bolster readiness for our future educators for the ever-changing demands of the digital age.

Table 2 presents a summary of pre-service teachers' reading habits across three dimensions. The analysis highlights a consistently high level of proficiency across all areas. The analysis shows positive patterns, with notable areas for improvement. Transitioning between these aspects highlights both strengths and opportunities to enhance reading habits for personal and professional development.

Table 2. Summary Table of Reading Habits

Dimensions of Reading Habits	**Mean**	**Interpretation**	**SD**
Frequency	3.53	Consistent	.737
Reading Duration	3.34	Moderately Consistent	.819
Reading Motivation	3.94	Consistent	.786
Overall Reading Habits	**3.60**	**Consistent**	**.780**

For reading frequency, the overall mean score of 3.53 (SD = 0.737), interpreted as "Consistent," indicates that pre-service teachers generally sustain regular reading habits. These findings are in agreement with Ahlfeld's (2020) research, which highlighted the value of reading for both personal and academic growth. However, the findings also displayed that, despite the initial understanding of reading's value, establishing structured daily reading routines remains a challenge. This suggest that resolving this gap within teacher education programs could help transform reading as not only a requirement to pass, but as a habitual practice.

For reading duration, pre-service teachers showed slightly lower consistency, with an overall mean of 3.34 (SD = 0.819), interpreted as "Moderately Consistent." These results suggest that while pre-service teachers can uphold moderate-length reading hours, they find it difficult to sustain continuous engagement during extended periods of

reading, particularly for complex materials with multifaceted content. This highlights a need for interventions which are aimed at building reading stamina and developing effective and structured readings routines to improve both engagement and duration.

For reading motivation, the data reflects a strong level of consistency, with an overall mean score of 3.94 (SD = 0.786), interpreted as “Consistent”. These findings align with Sur and Unal's (2024) study, signaling that the pre-service teachers value engaging and reading texts for scholarly and knowledge-building purposes. Nonetheless, there is room to develop a more well-rounded approach that incorporates reading for both leisure and relaxation, which could enhance intrinsic enjoyment and build lifelong reading habits.

In conclusion, while pre-service teachers exhibit consistent and high engagement with reading, particularly in areas of frequency and motivation, they still struggle in the domain of duration as they meet challenges in retaining longer reading periods. Teacher education programs could address these by creating projects and sessions which not only builds stamina for extended reading, promotes structured reading habits, but also encourages a balanced approach that includes both academic and personal reading. If successful, this strategy could create well-rounded reading practices that benefit educators throughout their careers.

Table 3 presents a summary of pre-service teachers’ reading comprehension skills across five dimensions. The analysis reveals strong performance across several domains, though some areas show more variability, indicating opportunities for specified improvement.

Table 3. Summary Table of Reading Comprehension Skills

Dimensions of Reading Comprehension Skills	**Mean**	**Interpretation**	**SD**
Identifying Main Ideas	4.48	Excellent Comprehension	.738
Retaining Concepts and Organizing Facts	4.13	Good Comprehension	.992
Isolating Details and Recalling Specific Facts	4.73	Excellent Comprehension	.674
Making an Inference	4.25	Excellent Comprehension	1.08
Drawing Conclusion	4.82	Excellent Comprehension	.508
Overall Reading Comprehension Skills	**4.48**	**Excellent Comprehension**	**.642**

For identifying main ideas, pre-service teachers demonstrated excellent comprehension, with an overall mean of 4.48 (SD = 0.738), interpreted as “Excellent Comprehension”. This high proficiency aligns with Gandjarwati's (2020) paper, which emphasizes the importance of recognizing main ideas as a foundational comprehension skill. The data suggests that pre-service teachers are well-prepared to both understand and teach this essential skill, contributing to overall reading comprehension success. For retaining concepts and organizing facts, the overall mean score of 4.13 (SD = 0.992) reflects "Good Comprehension." These results are parallel with Zlotnik and Vansintjan's (2019) article about the role of memory in comprehension. While pre-service teachers display competence in this area, the data of the study suggests a need for educational practices that further support concept retention and fact organization.

For isolating details and recalling specific facts, pre-service teachers excelled with a mean of 4.73 (SD = 0.674), categorized as "Excellent Comprehension." This aligns with Yeari and Lev's (2020) findings, which highlight the connection between higher comprehension levels and superior recall abilities. The strong performance in this domain suggests that pre-service teachers have developed effective strategies for processing and retaining information, essential for their future teaching practices. For making inferences, the data shows an overall mean of 4.25 (SD = 1.08), which indicates "Excellent Comprehension," though it ranks second to lowest among the comprehension areas. This reinforces Maguet et al.'s (2021) research, which highlights the complexity of inference-making as a cognitive process. While most pre-service teachers displayed good inference-making skills, the findings suggest that some may benefit from additional instruction to refine their inference-making abilities, which are necessary for critical thinking.

For drawing conclusions, pre-service teachers demonstrated the highest level of comprehension, with a mean score of 4.82 (SD = 0.508), indicating "Excellent Comprehension." This consistent performance reflects the strong foundational comprehension skills pre-service teachers have developed, allowing them to effectively synthesize information and draw well-supported conclusions from texts. These findings suggest that teacher education programs are successfully fostering this critical skill.

In conclusion, the analysis of these specific comprehension domains reveals that drawing conclusions and isolating details and recalling specific facts are the strongest areas, with pre-service teachers excelling in these domains. Identifying main ideas and making inferences also demonstrate strong proficiency, though with some variation in performance, particularly in inference-making. Retaining concepts and organizing facts scored the lowest, suggesting this area could benefit from targeted improvement. Overall, the data highlights the effectiveness of current educational practices while pointing to areas where further focus could enhance pre-service teachers' reading comprehension skills, ultimately benefiting their future students.

Table 4 examines the relationships between three aspects of digital literacy—competence, use, and transformation—and reading habits, including frequency, duration, and motivation. The findings reveal varying levels of significance across these dimensions.

Table 4. Test of Significant Correlation between Pre-Service Teachers' Reading Habits and Digital Literacy

Digital Literacy	Reading Habits								
	Frequency			Duration			Motivation		
	r-value	p-value	Sig.	r-value	p-value	Sig.	r-value	p-value	Sig.
Digital Competence	.369**	.000	Sig.	.468**	.000	Sig.	.452**	.000	Sig.
Digital Use	.231	.086	Not Sig.	.304*	.023	Sig.	.449*	.001	Sig.
Digital Transformation	.190	.161	Not Sig.	.227	.093	Not Sig.	.403**	.000	Sig.

*** Correlation is significant at the .01 level*

** Correlation is significant at the .05 level*

Digital Competence demonstrated the strongest positive correlations with reading habits. It shows a moderate

positive relationship with reading frequency (r = 0.369, p = 0.000), suggesting that higher digital competence is associated with more frequent reading. This finding reinforces the findings of Syamiya et al.'s (2024) study, which found that digital literacy enhances reading frequency, which in turn improves learning outcomes. Moreover, digital competence correlates positively with both reading duration (r = 0.468, p = 0.000) and motivation (r = 0.452, p = 0.000), validating the notion that higher digital skills develop prolonged engagement and motivation to read. This finding is in agreement with Cao's (2023), who emphasized the role of digital competence in enhancing professional skills and engagement with digital resources.

Digital Use exhibits weaker associations with reading habits. The correlation with reading frequency is weak and not statistically significant (r = 0.231, p = 0.086), indicating limited to zero influence on how often individuals read. This supports previous research by Ham and Hwang (2024), which indicated that digital device usage does not inherently improve reading frequency. However, digital use displayed a moderate positive relationship with reading duration (r = 0.304, p = 0.023) and motivation (r = 0.449, p = 0.001), pointing that frequent interaction with digital tools can support longer and more motivated reading sessions, as noted by Ostiz-Blanco (2021).

Digital Transformation, while associated with motivation (r = 0.403, p = 0.000), shows weak and insignificant correlations with frequency and duration of reading habits. The correlation with reading frequency (r = 0.190, p = 0.161) and duration (r = 0.227, p = 0.093) were not statistically significant, showing that digital transformation, while vital in educational settings, has limited impact on reading habits. However, the positive relationship with motivation is consistent with Haeroni et al.'s (2023) findings, which showed that digital literacy can enhance reading interest by providing greater access to digital resources.

In conclusion, digital competence plays a critical role in enhancing reading habits by fostering frequent, prolonged, and motivated reading. Digital use contributes moderately to reading duration and motivation, though its impact is weaker than competence. Meanwhile, digital transformation appears to primarily influence reading motivation, with minimal effects on frequency and duration. These findings underscore the importance of fostering digital competence and intentional use of digital tools to support reading habits, while the broader impact of digital transformation remains context-dependent.

Discussion and Conclusion

The study reveals a complex interplay between digital literacy, reading habits, and reading comprehension among pre-service teachers, validating Anderson's Schema Theory (1978) which posits that comprehension involves integrating new information with existing knowledge. The findings demonstrate how digital competence serves as a foundational schema that enables pre-service teachers to effectively navigate and integrate both traditional and digital reading 58 materials, supporting Wallace's (1992) assertion that schema activation is crucial for comprehension.

Giroux and Willistin's List of Comprehension Skills (1994) is also substantiated by the results, as pre-service teachers demonstrated varying proficiency levels across different comprehension skills, highlighting how these

abilities develop independently yet interconnectedly. The study particularly validates their framework's emphasis on the hierarchical nature of comprehension skills, where basic skills like identifying main ideas support more complex abilities such as drawing conclusions.

The research challenges some traditional assumptions about digital transformation in education, particularly the notion that increased digital tool usage automatically leads to improved reading habits. Instead, the findings suggest a more nuanced relationship where digital competence, rather than mere digital use or transformation, plays the most crucial role in developing effective reading habits and comprehension skills. This understanding provides a new perspective on how digital literacy should be approached in teacher education programs.

The results also extend beyond the initial theoretical frameworks by revealing how motivation serves as a critical bridge between digital literacy and reading comprehension. This finding introduces an important dimension not fully addressed in the original theoretical foundations, suggesting that future models of reading comprehension in the digital age should incorporate motivational factors more explicitly.

The study concludes that digital literacy, reading habits, and reading comprehension are interconnected components in shaping pre-service teachers' academic proficiency. Higher digital competence enables pre-service teachers to navigate digital platforms, access online reading materials, and engage with texts using diverse digital strategies, which in turn strengthens their reading habits. These habits contribute to better comprehension outcomes, particularly in skills such as drawing conclusions and isolating details. However, even with strong comprehension scores, weaknesses in retaining and organizing information reveal the need for explicit instruction in information processing and retention.

The insights from the study call for a recalibration of how pre-service teacher education programs approach digital literacy and reading comprehension training. Rather than treating them as separate competencies, the findings advocate for an integrated approach that recognizes their interdependence and the crucial role of motivation in their development. This conclusion supports a more holistic model of literacy development that combines traditional reading strategies with digital competencies, while emphasizing the importance of building intrinsic motivation for both reading and digital skill development.

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