



## Utilization of Computer-Aided Instruction (CAI) in Relation to Learners' Reading Proficiency

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Received: November 22, 2025

Revised: December 18, 2025

Accepted: December 23, 2025

### ABSTRACT

Technology alone does not guarantee literacy gains; rather, the effectiveness of technology depends largely on how it is integrated into instruction. This study aimed to determine the relationship between the extent of teachers' utilization of computer-aided instruction (CAI) and the reading proficiency of learners. Employing the descriptive method, the study involved 47 Grade 6 teachers in a district of large-sized division using the ORV results for SY 2019–2020 as secondary data for reading proficiency. Findings revealed that most teachers were older, married, and had longer service experience. Results also showed a great extent of CAI utilization (both hardware and software) regardless of age, civil status, or years in service. Despite this, statistical analysis found no significant relationship between the extent of CAI use and learners' reading proficiency level. This finding may suggest that improvements in reading outcomes had already been established prior to the implementation of CAI, or that other factors such as instructional strategies, learner engagement, and home literacy environment-play a more substantial role in reading development. Hence, continued efforts to explore how CAI supports reading proficiency in diverse classroom contexts remain valuable.

**Keywords:** Computer-Aided Instruction, Learners, Reading Proficiency

### How to Cite:

Dagle, M. J. B. (2025). Utilization of Computer-Aided Instruction (CAI) in Relation to Learners' Reading Proficiency. *Global Journal of STEM Education & Management Research*, 1(1), 158-173. <https://doi.org/10.5281/zenodo.17862306>



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## INTRODUCTION

The 21st century has transformed educational needs, making traditional lecture-based instruction less effective for modern learners. Computer-Assisted Instruction (CAI), first implemented in the United States in the 1960s, has been widely recognized for its potential to enhance instructional delivery and learners' outcomes (Levin & Wadmany, 2016). Since then, CAI has increasingly become an essential component of effective teaching and learning, addressing the growing academic and technological demands of today's learners.

Reading proficiency has long been associated with overall academic achievement in subjects such as English, Math, and Science. Because of its fundamental role in learning, the Department of Education continues to implement targeted actions to improve students' reading abilities, recognizing that strong reading skills support performance across all areas.

In the Philippine classroom setting, CAI has demonstrated substantial potential in improving learners' reading proficiency. Research also indicates enhanced comprehension, pronunciation, grammar, and language mastery among primary and intermediate learners using CAI. Several studies conducted in the Philippines context report that learners exposed to CAI demonstrate increased motivation, engagement, and improvements in selected reading-related skills such as comprehension and pronunciation (Llego, 2020). However, limited access to internet connectivity and digital devices continues to restrict its implementation in rural areas.

It is in this light that the researcher was prompted to undertake this study to investigate the teachers' use of computer-aided instruction in relation to reading proficiency and academic performance.

## OBJECTIVES OF THE STUDY

This study aimed to determine the utilization of Computer-Aided Instruction (CAI) in relation to the reading proficiency of Grade 6 learners in a district of a large-sized division in Central Philippines. Specifically, the study sought to: 1) determine the extent of CAI utilization by Grade 6 teachers in terms of hardware and software; 2) identify the reading proficiency of Grade 6 learners; 3) examine the difference in CAI utilization when grouped according to selected demographic variables; 4) test the significant differences in CAI utilization across these groupings; and 5) determine the relationship between CAI utilization and learners' reading proficiency.

## LITERATURE REVIEW

Computer-Aided Instruction (CAI) has become an essential component of 21st-century teaching and learning, with its effectiveness recognized since its early use in the 1960s in the United States (Levin & Wadmany, 2016). Modern classrooms now rely on digital tools, including e-books, read-aloud applications, and interactive software—that expand learners' access to texts and enhance reading comprehension and language development. ICT further strengthens collaboration and communication among students (Koc, 2015) and supports constructivist learning by allowing learners to engage more deeply with higher-level concepts (Levin & Wadmany, 2016). This integration relies heavily on hardware, which serves as the foundation for all educational software (Lanni, 2024).

Moreover, extensive research highlights CAI's significant contributions to reading proficiency and overall academic performance. Studies in the Philippines and abroad consistently show that CAI increases learner motivation, comprehension, pronunciation, and language mastery, outperforming traditional instruction (McMahon, 2017; Baguhin et al., 2017; Saldon-Eder et al., 2016; Chard, 2017; Macaruso & Walker, 2018). Teachers also benefit from CAI through improved productivity and engaging instructional materials. Further, factors such as marital status and external support can influence ICT integration (Bongado et al., 2025; Yang et al., 2024; Xu et al., 2025), while novice teachers often demonstrate higher digital competence compared to veterans (Lancher et al., 2024; Peng et al., 2023; Gu et al., 2023). However, studies also show that age is not a determinant of ICT usage, and motivation and institutional support play more critical roles (Keržič et al., 2021; Šumak et al., 2021).

Overall, CAI is recognized as a transformative instructional medium that enhances engagement, supports foundational reading skills, and strengthens higher-order thinking (Kozan, 2015; Nazimuddin, 2016; McMahon, 2018). Despite variations in digital competence among teachers, research affirms widespread ICT adoption and its potential to improve learning outcomes when supported by adequate training and infrastructure (Ayunar et al., 2024; Oducado et al., 2023; Llameria & Ubayubay, 2024). In addition, CAI has been shown to enhance pedagogical methods, increasing students' participation, interest, and performance (Chavez, 2016). These findings collectively demonstrate CAI's vital role in modern education and its capacity to strengthen learners' reading proficiency and overall academic success.



Meanwhile, reading proficiency is shaped significantly by the home literacy environment, where access to books, storytelling, and parental involvement fosters early literacy development. Research shows that children's attitudes toward reading often decline with age (Sainsbury & Schazan, 2017), making consistent exposure at home crucial to sustaining interest. Foundational skills such as decoding are essential, as students must accurately and fluently identify words before they can fully comprehend texts (Connors-Tadros, 2015). Because reading is a cognitive process involving active engagement with the text (Cullinan, 2016), learners from homes rich in reading materials and resources tend to perform better, although many still remain at the "frustration" level (Navarra, 2023).

Furthermore, reading proficiency is a powerful determinant of academic achievement, future employability, and lifelong learning. It supports access to knowledge, strengthens critical thinking, and equips individuals with skills needed for personal and social growth (Romero & Romero, 2016). Several interrelated factors influence reading development, including teacher support, learner motivation, and home and school environments (Francia & Aranda, 2023). International studies highlight the importance of socio-economic status, metacognition, and reflective thinking as predictors of reading literacy (Koyuncu & Fırat, 2021), while high-performing regions in PISA 2018 show that many students reach instructional proficiency levels in reading (Li et al., 2023).

Finally, empirical evidence also underscores the role of technology and consistent reading practice in improving literacy. Reading assistant software has been shown to significantly enhance reading fluency and support gains in comprehension among ESL learners (Dujim et al., 2025). Local studies reveal similar mixed but promising outcomes: many Grade 3 learners remain at the frustration level but show potential to reach instructional levels with support (Diocales & Bantulo, 2023), and Grade 6 learners demonstrate moderate comprehension and fluency (Dequita, n.d.). Furthermore, regular engagement with printed and digital reading materials correlates positively with reading comprehension and academic performance among Filipino learners (Francisco & Madrazo, 2019). Collectively, these studies suggest that while CAI enhances engagement and selected literacy skills, its effectiveness is mediated by teacher competence, instructional design, and contextual support.

## METHODOLOGY

This section presents the discussion of the research methodology used, the subjects and respondents of the study, the research instruments used, the validity and reliability of the instruments, the procedure for data gathering, and the statistical tools and procedure for data analysis.

### ***Research Design***

This study employed a descriptive-correlational research design to examine the relationship between teachers' CAI utilization and learners' reading proficiency. Descriptive research, systematically outlines the characteristics of a population or phenomenon, focuses on identifying "what" exists in the current situation rather than explaining how or why it occurred (Bhandari, 2020). Because the study aimed to determine the existing relationship between CAI use and reading proficiency through established measurement and survey procedures, the descriptive method was deemed the most appropriate approach for generating accurate and meaningful conclusions.

### ***Study Respondents***

The respondents of the study were the 47 Grade 6 teachers coming from 16 elementary schools. Purposive sampling was employed due to the manageable size of the respondent population and the study's specific inclusion criteria. Purposive sampling is a non-probability sampling method that is chosen based on demographic characteristics and the study's objectives (Crossman, 2020).

### ***Instruments***

This study utilized a researcher-made questionnaire to collect data on teachers' use of Computer-Aided Instruction (CAI) and learners' reading proficiency for the 2019–2020 school year. The tool consisted of two parts: respondents' demographic profiles and a 30-item survey measuring CAI utilization, with 15 items each for hardware and software, rated on a five-point Likert scale. Its validity—defined by Mohajan (2017) as the extent to which an instrument measures what it intends to measure—was ensured through evaluation by three content experts, resulting in an excellent validity rating of 4.07 based on Good and Scates' criteria. Reliability, described by Mohajan (2017) as the consistency and accuracy of measurement, was established through Cronbach's Alpha, a measure of internal consistency (Sileyew, 2019). Tested on 30 non-respondent Grade 6 teachers, the instrument achieved a reliability coefficient of 0.953, indicating excellent reliability.

### ***Data Gathering Procedure***



A letter requesting to conduct the study was sent to the Schools Division Superintendent. Upon the approval of the SDS, a second written request was sent to the District-In-Charge and to the School Heads of the 16 elementary schools. Once the approval of the second request was secured, the questionnaires were administered to the 47 teacher respondents.

### **Data Analysis and Statistical Treatment**

Objective No. 1 also used the descriptive analytical scheme and mean to determine the extent of utilization of computer-aided instruction by teachers in the areas of hardware and software.

Objective No. 2 likewise used the descriptive-analytical scheme and mean to determine the level of reading proficiency of learners for the school year 2019-2020.

Objective No. 3 likewise utilized the descriptive analytical scheme and mean to determine the extent of utilization of computer-aided instruction when grouped according to the variables.

Objective No. 4 employed the comparative analytical scheme and Mann-Whitney U-test to determine the significant difference in the extent of utilization of computer-aided instruction of teachers when grouped and compared according to the variables.

Objective No. 5 used the relational analytical scheme and Spearman's rho to establish the relationship between the extent of utilization of Computer-Aided Instruction by teachers and the level of reading proficiency of learners.

### **Ethical Consideration**

The study adhered to ethical standards to protect the rights and welfare of respondents. Participation was voluntary, with informed consent obtained through a signed form, and participants were free to withdraw at any time. Respondents were fully informed of the study's purpose and potential risks, though no harm was anticipated. Confidentiality was strictly maintained, and identifying information was not shared beyond the research team. Anonymity was also respected, with respondents' names included only if they chose to provide them.

## **RESULTS AND DISCUSSION**

This section deals with the presentation, analysis and interpretation of data gathered to carry out the objectives of this study. All these were made possible by following certain appropriate procedures so as to give the exact data and solution to each specific problem.

**Table 1**

### *Extent of Utilization of Computer-Aided Instruction of Teachers According to Hardware*

Items	Mean	Interpretation
<i>To what extent did you utilize the hardware in...</i>		
1. arousing the interest of learners in listening to the basic sounds of the Alphabet.	4.00	Great extent
2. increasing the learners' mastery of vocabulary and pronunciation as they imitate the radio presenter.	3.83	Great extent
3. motivating the learners to avoid falling back to their mother tongue.	4.15	Great extent
4. increasing and improving learners' imagination and listening skills.	4.34	Great extent
5. stimulating thinking and imagination through music and different sound effects.	3.11	Moderate extent
6. enhancing the reading skills of learners.	4.43	Great extent
7. helping learners improve reading comprehension skills.	4.51	Very great extent
8. helping build literacy concepts and skills through rhymes in moving pictures.	2.94	Moderate extent



9. helping learners recognize more complicated words	3.91	Great extent
10. evoking reading interests.	4.43	Great extent
11. presenting various reading games	2.96	Moderate extent
12. illustrating concept through attractive animation, sound, and demonstration.	2.49	Low extent
13. capturing the interest of the learners to develop their reading inclination.	4.21	Great extent
14. in challenging the learners to become independent and self-directed in learning various reading methods.	4.45	Great extent
15. in teaching phonics with sounds, with speed and accuracy, and provides learners with feedback and interaction.	3.70	Great extent
<b>Overall Mean</b>	<b>3.83</b>	<b>Great extent</b>

Table 1 shows the extent of computer-aided instruction utilization by teachers according to hardware. As shown in the Table, the overall mean was 3.83, indicating a high degree of utilization of computer-aided instruction in the hardware area. This indicates a consistently high level of CAI utilization among Grade 6 teachers in terms of hardware.

The highest mean result was 4.51, interpreted as a very great extent, on item number 7, which pertains to utilizing hardware in helping learners improve their reading comprehension skills. On the contrary, item no. 12 yielded the lowest mean result of 2.49, indicating a low extent. It involves utilizing CAI to illustrate concepts through engaging animations, sound effects, and demonstrations. This may be due to limited access to advanced CAI tools or a lack of training among teachers in effectively integrating multimedia elements, such as animations, sound, and demonstrations, into their lessons.

This supports the study by Besaña (2025), which highlighted that while CAI has the potential to enhance teaching practices, its effective use, particularly in incorporating multimedia elements such as animations and sound, is often hindered by factors including a lack of resources and inadequate teacher training.

**Table 2**

*Extent of Utilization of Computer-Aided Instruction of Teachers According to Software*

Items	Mean	Interpretation
<i>To what extent did you utilize the software in...</i>		
1. identifying phonemes/individual sounds which aids in the understanding of the text selection read.	3.36	Moderate extent
2. mastering and manipulating phonemes in spoken words.	3.00	Moderate extent
3. developing the reading proficiency of the learners.	4.47	Great extent
4. improving the reading acquisition of learners during classroom instruction.	4.51	Very great extent
5. assisting the reading performance learners during remedial/ enrichment activities in an instructional manner.	4.45	Great extent
6. helping learners read a text accurately, quickly, and expressively.	4.32	Great extent
7. prioritizing in-depth understanding of the text/selection.	3.91	Great extent
8. mastering the necessary reading fluency components: speed, accuracy and prosody (pitch, stress and timing).	3.06	Moderate extent
9. improving the learners' fluency in reading which will lead to reading acquisition.	4.11	Great extent



10. introducing how to master speed, accuracy, and prosody in reading.	3.47	Moderate extent
11. guiding learners in constructing meaning from the text/selection read	4.28	Great extent
12. stocking the words read for future usage in communication and acquiring knowledge.	4.13	Great extent
13. identifying meanings of unfamiliar words using context clues.	4.30	Great extent
14. recalling the meaning of unfamiliar words when encountering them the second time.	4.32	Great extent
15. analyzing the implications/ consequences of the selection from the context of the words/selections read.	4.34	Great extent
<b>Overall Mean</b>	<b>4.00</b>	<b>Great extent</b>

Table 2 illustrates the extent of computer-aided instruction utilization by teachers in the software area. As revealed in Table 4, the overall mean was 4.00, interpreted as a great extent. This portrays that Grade 6 teachers recurrently observe the utilization of computer-aided instruction, particularly in the software area, when teaching reading proficiency to the class. Going further through the Table, it is evident that item number 4, which states "improving the reading acquisition of learners during classroom instruction," has the highest mean of 4.51, interpreted as a very great extent.

As to the lowest mean, it was obtained by item no. 2, which states "mastering and manipulating phonemes in spoken words"; with a score of 3.00 interpreted as a moderate extent. This finding suggests that when teachers utilize the software in computer-aided instruction, teaching phonemes is no longer emphasized for Grade 6 learners, as they have already mastered this skill during their primary grades.

This result backs up the study of Chard (2017) that, in addition to phonological awareness, studies found evidence that computer-aided instruction benefits the acquisition of letter-sound knowledge, word identification skills, and rapid meaning/word fluency.

**Table 3**

*Level of Reading Proficiency of Learners*

School	Mean	Interpretation
A	91.16	Instructional
B	93.69	Instructional
C	83.33	Frustration
D	92.92	Instructional
E	93.56	Instructional
F	97.57	Independent
G	88.63	Frustration
H	90.15	Instructional
I	96.21	Instructional
J	93.43	Instructional
K	94.70	Instructional
L	90.53	Instructional
M	91.66	Instructional



N	88.26	Frustration
O	95.96	Instructional
P	97.57	Independent
<b>Overall Mean</b>	<b>92.46</b>	<b>Instructional</b>

Table 3 presents the reading proficiency levels of learners. As shown in the Table, the overall mean for the 16 elementary schools was 92.46, which is interpreted as Instructional.

This finding suggests that the learners can read with ease when being guided by the teacher. At the instructional level, learners should be guided to be more aware of their level of achievement, as well as their specific strengths and weaknesses in reading, because increased awareness can make instruction more effective.

This supports the study by Plotado (2024) on the implementation of the Phil-IRI Program with Grade 6 pupils, which revealed that most pupils were at the instructional oral reading level. This finding is also similar to that of Diocales and Bantulo (2023), who found that while many students were at the "frustration" level, a notable segment reached the "instructional" level, indicating that a substantial number of learners could comfortably tackle reading tasks with teacher support. On the contrary, this finding contradicts Dequita's investigation of Grade 6 learners, which showed that students' reading skills in both comprehension and fluency were at a moderate level, just approaching the instructional level. Also, Li et al.'s (2023) study found that nearly half of 15-year-old students reached or exceeded Level 4 in reading literacy—a level classified as *instructional* proficiency.

**Table 4**

*Extent of Utilization of Computer-Aided Instruction of Teachers in the Area of Hardware When Grouped according to Age*

Item	Younger		Older	
	Mean	Interpretation	Mean	Interpretation
<i>To what extent did you utilize the hardware in...</i>				
1. arousing the interest of learners in listening to the basic sounds of the Alphabet.	4.18	Great extent	3.84	Great extent
2. increasing the learners' mastery of vocabulary and pronunciation as they imitate the radio presenter.	3.86	Great extent	3.80	Great extent
3. motivating the learners to avoid falling back to their mother tongue.	4.18	Great extent	4.12	Great extent
4. increasing and improving learners' imagination and listening skills.	4.50	Very great extent	4.20	Great extent
5. stimulating thinking and imagination through music and different sound effects.	2.95	Moderate extent	3.24	Moderate extent
6. enhancing the reading skills of learners.	4.45	Great extent	4.40	Great extent
7. helping learners improve reading comprehension skills.	4.41	Great extent	4.60	Very great extent
8. helping build literacy concepts and skills through rhymes in moving pictures.	2.91	Moderate extent	2.96	Moderate extent
9. helping learners recognize more complicated words	4.23	Great extent	3.64	Great extent
10. evoking reading interests.	4.64	Very great extent	4.24	Great extent



11. presenting various reading games	3.14	Moderate extent	2.80	Moderate extent
12. illustrating concept through attractive animation, sound, and demonstration.	2.50	Moderate extent	2.48	Low extent
13. capturing the interest of the learners to develop their reading inclination.	4.36	Great extent	4.08	Great extent
14. in challenging the learners to become independent and self-directed in learning various reading methods.	4.59	Very great extent	4.32	Great extent
15. in teaching phonics with sounds, with speed and accuracy, and provides learners with feedback and interaction.	3.59	Great extent	3.80	Great extent
<b>Overall Mean</b>	<b>3.90</b>	<b>Great extent</b>	<b>3.77</b>	<b>Great extent</b>

Table 4 presents the extent of computer-aided instruction utilization by teachers, categorized by hardware and grouped by age. The overall means for both areas are interpreted as a great extent; 3.90 for the younger group and 3.77 for the older group.

Examining further, it is evident that the mean results vary greatly in item no. 9, where the younger group scored 4.23, while the older group scored 3.64, both of which are of great extent. This involves utilizing computer hardware to help learners recognize more complex words. This variation may be due to younger teachers being more familiar and comfortable with using modern computer hardware, which allows them to integrate it more effectively into teaching strategies that support learners in recognizing complex words. While older teachers may be less exposed to or less confident in using newer technologies, this could impact the extent to which they utilize computer hardware to facilitate advanced word recognition among learners.

The result does not support Macaruso and Walker's (2018) study, revealing that teachers across ages employed the use of computer applications to effectively cater to the reading needs and skills of their students. The age of the teacher did not affect the usage of computer applications since they are already familiar with them.

**Table 5**

*Extent of Utilization of Computer-Aided Instruction of Teachers in the Area of Software When Grouped according to Age*

Item	Younger		Older	
	Mean	Interpretation	Mean	Interpretation
<i>To what extent did you utilize the software in...</i>				
1. identifying phonemes/individual sounds, which aids in the understanding of the text selection read.	3.59	Great extent	3.16	Moderate extent
2. mastering and manipulating phonemes in spoken words.	3.18	Moderate extent	2.84	Moderate extent
3. developing the reading proficiency of the learners.	4.77	Very great extent	4.20	Great extent
4. improving the reading acquisition of learners during classroom instruction.	4.77	Very great extent	4.28	Great extent
5. assisting the reading performance of learners during remedial/enrichment activities in an instructional manner.	4.59	Very great extent	4.32	Great extent
6. helping learners read a text accurately, quickly, and expressively.	4.41	Great extent	4.24	Great extent
7. prioritizing in-depth understanding of the text/selection.	4.27	Great extent	3.60	Great extent
8. mastering the necessary reading fluency components: speed, accuracy and prosody (pitch, stress and timing).	3.36	Moderate extent	2.80	Moderate extent



9. improving the learners' fluency in reading which will lead to reading acquisition.	4.09	Great extent	4.12	Great extent
10. introducing how to master speed, accuracy, and prosody in reading.	3.41	Moderate extent	3.52	Great extent
11. guiding learners in constructing meaning from the text/selection read	4.50	Very great extent	4.08	Great extent
12. stocking the words read for future usage in communication and acquiring knowledge.	4.05	Great extent	4.20	Great extent
13. identifying meanings of unfamiliar words using context clues.	4.23	Great extent	4.36	Great extent
14. recalling the meaning of unfamiliar words when encountering them the second time.	4.23	Great extent	4.40	Great extent
15. analyzing the implications/ consequences of the selection from the context of the words/selections read.	4.23	Great extent	4.44	Great extent
<b>Overall Mean</b>	<b>4.11</b>	<b>Great extent</b>	<b>3.90</b>	<b>Great extent</b>

Table 5 presents the extent of computer-aided instruction utilization by teachers, categorized by software and age group. As shown in the table, the overall means for both younger and older groups had the same interpretation, indicating a great extent, 4.11 for the younger group and 3.90 for the older group.

A closer examination of each item reveals that item no. 3 showed the greatest variation, with a rating of 4.77 or a very great extent from the younger group and 4.28 or a great extent from the older group. This item pertains to the use of software in enhancing learners' reading proficiency. This suggests that younger teachers are more inclined to utilize educational software extensively because of their greater familiarity and comfort with digital tools. In contrast, older teachers may be less inclined or confident in integrating such technology due to their lower digital literacy and a generational gap in instructional technology use. This does not align with the study of Ayunar et al. (2024), which found that years of teaching experience correlated negatively with ICT competency—more experienced teachers demonstrated lower digital literacy than their younger counterparts.

**Table 6**

*Extent of Utilization of Computer-Aided Instruction of Teachers in the Area of Hardware and When Grouped According to Civil Status*

Items	Mean	Single Interpretation	Mean	Married Interpretation
<i>To what extent did you utilize the hardware in</i>				
1. arousing the interest of learners in listening to the basic sounds of the Alphabet.	3.77	Great extent	4.09	Great extent
2. increasing the learners' mastery of vocabulary and pronunciation as they imitate the radio presenter.	3.69	Great extent	3.88	Great extent
3. motivating the learners to avoid falling back on their mother tongue.	3.92	Great extent	4.24	Great extent
4. increasing and improving learners' imagination and listening skills.	4.31	Great extent	4.35	Great extent
5. stimulating thinking and imagination through music and different sound effects.	2.92	Moderate extent	3.18	Moderate extent
6. enhancing the reading skills of learners.	4.38	Great extent	4.44	Great extent
7. helping learners improve reading comprehension skills.	4.54	Very great extent	4.50	Very great extent
8. helping build literacy concepts and skills through rhymes in moving pictures.	2.92	Moderate extent	2.94	Moderate extent
9. helping learners recognize more complicated words	4.00	Great extent	3.88	Great extent
10. evoking reading interests.	4.54	Very great extent	4.38	Great extent
11. presenting various reading games	3.15	Moderate extent	2.88	Moderate extent



12. illustrating concept through attractive animation, sound, and demonstration.	2.08	Low extent	2.65	Moderate extent
13. capturing the interest of the learners to develop their reading inclination.	4.08	Great extent	4.26	Great extent
14. in challenging the learners to become independent and self-directed in learning various reading methods.	4.46	Great extent	4.44	Great extent
15. in teaching phonics with sounds, with speed and accuracy, and provides learners with feedback and interaction.	3.54	Great extent	3.76	Great extent
<b>Overall Mean</b>	<b>3.75</b>	<b>Great extent</b>	<b>3.86</b>	<b>Great extent</b>

Table 6 depicts the extent of utilization of computer-aided instruction of learners in the areas of hardware when grouped according to civil status. As shown in the table, the overall mean for the single and married groups was 3.75 and 3.86, respectively; both interpreted as a great extent.

However, a closer look at the results for each item reveals that item no. 12 showed a more pronounced variation, with a rating of 2.08 or low extent for the single group and 2.65 or moderate extent for the married group. This is on the utilization of hardware by illustrating the concept through attractive animation, sound, and demonstration. This finding suggests that single teachers may use hardware less because they often have more personal responsibilities and less support. In contrast, married teachers may have more time and help, allowing them to better use technology with animations, sounds, and demonstrations. Married teachers tend to seek tangible proof of technology's impact on learning, while single teachers may explore interactive tools less effectively due to personal concerns.

This finding is consistent with the study conducted by Bongado et al. (2025), which revealed variation in technology integration practices among teachers based on their marital status. Similarly, the result also lends credit to Yang et al. (2024), revealing that married teachers demonstrated significantly better ICT integration approaches compared to their single counterparts.

**Table 7**

*Extent of Utilization of Computer-Aided Instruction of Teachers in the Area of Software, and When Grouped According to Civil Status*

Items	Mean	Single Interpretation	Mean	Married Interpretation
<i>To what extent did you utilize the software in</i>				
1. identifying phonemes/individual sounds, which aids in the understanding of the text selection being read.	3.31	Moderate extent	3.38	Moderate extent
2. mastering and manipulating phonemes in spoken words.	2.77	Moderate extent	3.09	Moderate extent
3. developing the reading proficiency of the learners.	4.62	Very great extent	4.41	Great extent
4. improving the reading acquisition of learners during classroom instruction.	4.77	Very great extent	4.41	Great extent
5. assisting the reading performance of learners during remedial/ enrichment activities in an instructional manner.	4.62	Very great extent	4.38	Great extent
6. helping learners read a text accurately, quickly, and expressively.	4.46	Great extent	4.26	Great extent
7. prioritizing an in-depth understanding of the text/selection.	4.08	Great extent	3.85	Great extent
8. mastering the necessary reading fluency components: speed, accuracy, and prosody (pitch, stress, and timing).	3.46	Moderate extent	2.91	Moderate extent
9. improving the learners' fluency in reading, which will lead to reading acquisition.	4.00	Great extent	4.15	Great extent
10. introducing how to master speed, accuracy, and prosody in reading.	3.46	Moderate extent	3.47	Moderate extent
11. guiding learners in constructing meaning from the text/selection read	4.23	Great extent	4.29	Great extent
12. stocking the words read for future usage in communication and acquiring knowledge.	3.69	Great extent	4.29	Great extent
13. identifying meanings of unfamiliar words using context clues.	3.92	Great extent	4.44	Great extent



14. recalling the meaning of unfamiliar words when encountering them the second time.	3.92	Great extent	4.47	Great extent
15. analyzing the implications/ consequences of the selection from the context of the words/selections read.	3.92	Great extent	4.50	Very great extent
<b>Overall Mean</b>	<b>3.95</b>	<b>Great extent</b>	<b>4.02</b>	<b>Great extent</b>

Table 7 depicts the extent of utilization of computer-aided instruction of learners in the area of software when grouped according to civil status. The overall mean for the single and married groups was 3.95 and 4.02, respectively; both interpreted as a great extent.

Upon examining the results of each item thoroughly, it can be noted that in item no. 15, the mean results varied significantly; 3.92, to a great extent, for the single category and 4.50, to a very great extent, for the married category. This involves the utilization of software to analyze the implications/ consequences of the selection within the context of the words/selections read. Married teachers tend to utilize software extensively compared to single teachers, possibly because they have practical support and help, which enables them to integrate digital tools more thoroughly for analyzing texts and helping students grasp word meanings, contextual clues, and underlying messages.

The result is similar to that of Xu et al.'s (2025) study, which showed that external support, such as encouragement from colleagues and access to technical assistance, is significantly linked to higher ICT integration ability. Nevertheless, the study did not emphasize comparison based on civil status.

**Table 8**

*Extent of Utilization of Computer-Aided Instruction of Teachers in the Area of Hardware and When Grouped According to Length of Service*

Items	Mean	Shorter Interpretation	Mean	Longer Interpretation
<i>To what extent did you utilize the hardware in</i>				
1. arousing the interest of learners in listening to the basic sounds of the Alphabet.	4.09	Great extent	3.92	Great extent
2. increasing the learners' mastery of vocabulary and pronunciation as they imitate the radio presenter.	3.96	Great extent	3.71	Great extent
3. motivating the learners to avoid falling back on their mother tongue.	4.22	Great extent	4.08	Great extent
4. increasing and improving learners' imagination and listening skills.	4.48	Great extent	4.21	Great extent
5. stimulating thinking and imagination through music and different sound effects.	3.00	Moderate extent	3.21	Moderate extent
6. enhancing the reading skills of learners.	4.39	Great extent	4.46	Great extent
7. helping learners improve reading comprehension skills.	4.52	Very great extent	4.50	Very great extent
8. helping build literacy concepts and skills through rhymes in moving pictures.	3.00	Moderate extent	2.88	Moderate extent
9. helping learners recognize more complicated words	4.04	Great extent	3.79	Great extent
10. evoking reading interests.	4.48	Great extent	4.38	Great extent
11. presenting various reading games	3.17	Moderate extent	2.75	Moderate extent
12. illustrating concept through attractive animation, sound, and demonstration.	2.61	Moderate extent	2.38	Low extent
13. capturing the interest of the learners to develop their reading inclination.	4.35	Great extent	4.08	Great extent
14. in challenging the learners to become independent and self-directed in learning various reading methods.	4.65	Very great extent	4.25	Great extent
15. in teaching phonics with sounds, with speed and accuracy, and provides learners with feedback and interaction.	3.83	Great extent	3.58	Great extent
<b>Overall Mean</b>	<b>3.92</b>	<b>Great extent</b>	<b>3.74</b>	<b>Great extent</b>

Table 8 reveals the extent of computer-aided instruction utilization among learners in the area of hardware, grouped by length of service. As depicted in the Table, the overall means for the shorter and longer categories are 3.92 and 3.74, respectively, both of which are interpreted as being to a great extent. By analyzing the results, item no. 14 showed the greatest variation, with 4.65 for shorter and 4.25 for longer teaching experience; however, both indicate a significant extent. This item pertains to using hardware to challenge learners to become independent and self-directed in learning various reading methods. Both new and



experienced teachers reported high usage, likely due to up-to-date training and enthusiasm for technology. These combined strengths allow both groups to foster student independence and self-directed learning, especially when guiding learners through various reading methods using technology-enhanced instruction. However, experienced teachers, having deeper pedagogical knowledge and classroom management skills, may integrate hardware more strategically to foster independent and self-directed learning.

This contradicts the findings of Lancher et al. (2024), suggesting that new teachers often integrate technology enthusiastically due to recent training and familiarity with current digital tools. In contrast, experienced teachers rely on their well-developed teaching strategies and in-depth classroom understanding to utilize hardware effectively.

**Table 9**

*Extent of Utilization of Computer-Aided Instruction of Teachers in the Areas of Software and When They are Grouped According to Length of Service*

Items	Mean	Shorter Interpretation	Mean	Longer Interpretation
<i>To what extent did you utilize the software in</i>				
1. identifying phonemes/individual sounds, which aids in the understanding of the text selection being read.	3.57	Great extent	3.17	Moderate extent
2. mastering and manipulating phonemes in spoken words.	3.09	Moderate extent	2.92	Moderate extent
3. developing the reading proficiency of the learners.	4.70	Very great extent	4.25	Great extent
4. improving the reading acquisition of learners during classroom instruction.	4.70	Very great extent	4.33	Great extent
5. assisting the reading performance of learners during remedial/ enrichment activities in an instructional manner.	4.48	Great extent	4.42	Great extent
6. helping learners read a text accurately, quickly, and expressively.	4.43	Great extent	4.21	Great extent
7. prioritizing an in-depth understanding of the text/selection.	4.09	Great extent	3.75	Great extent
8. mastering the necessary reading fluency components: speed, accuracy, and prosody (pitch, stress, and timing).	3.30	Moderate extent	2.83	Moderate extent
9. improving the learners' fluency in reading, which will lead to reading acquisition.	3.91	Great extent	4.29	Great extent
10. introducing how to master speed, accuracy, and prosody in reading.	3.48	Moderate extent	3.46	Moderate extent
11. guiding learners in constructing meaning from the text/selection read	4.35	Great extent	4.21	Great extent
12. stocking the words read for future usage in communication and acquiring knowledge.	4.00	Great extent	4.25	Great extent
13. identifying meanings of unfamiliar words using context clues.	4.09	Great extent	4.50	Very great extent
14. recalling the meaning of unfamiliar words when encountering them the second time.	4.22	Great extent	4.42	Great extent
15. analyzing the implications/ consequences of the selection from the context of the words/selections read.	4.17	Great extent	4.50	Very great extent
<b>Overall Mean</b>	<b>4.04</b>	<b>Great extent</b>	<b>3.97</b>	<b>Great extent</b>

Table 9 depicts the extent of utilization of computer-aided instruction of learners in the area of software when grouped according to length of service. The Table shows that the overall mean for shorter and longer services is 4.04 and 3.97, respectively, both of which are interpreted as a great extent.

However, upon examining each item's results closely, it is evident that item no. 3 had greater variation in its mean result; 4.70 or very great extent for the shorter category, and 4.25 or great extent for the longer category. This is about the use of software in developing reading proficiency in learners. Teachers with shorter lengths of service often demonstrate a high degree of software utilization because they are more recently trained, technologically proficient, and open to using digital tools to develop students' reading proficiency. At the same time, teachers with longer service lengths may use software to a great extent but rely more on traditional methods due to established teaching habits and less frequent exposure to newer technologies.



This supports Peng et al.'s (2023) study, which found that teachers with fewer than three years of experience exhibited significantly higher positive attitudes, digital competence, self-efficacy, and ICT integration ability than teachers with more than ten years of experience. Similarly, the finding also supports Iinuma et al. (2025), revealing that teachers who possess high self-confidence and positive perceptions of digital tools — qualities commonly observed in novice teachers due to recent training — are more motivated to use software extensively in reading and writing instruction.

**Table 10**

*Difference in the Extent of Utilization of Computer-Aided Instruction of Teachers in the Area of Hardware and When Grouped and Compared According to the Age, Civil Status, and Length of Service*

Variables	Categories	N	Mean Rank	Mann Whitney U-test	Sig. Level	p-value	Interpretation
Age	Younger	22	27.16	205.500	0.05	0.137	Not Significant
	Older	25	21.22				
Civil Status	Single	13	22.81	205.500	0.05	0.712	Not Significant
	Married	34	24.46				
Length of Service	Shorter	23	27.26	201.000	0.110	0.110	Not Significant
	Longer	24	20.88				

Table 10 presents the difference in the extent of computer-aided instruction utilization in the area of hardware when grouped and compared by age, civil status, and length of service. It can be noted from the Table that the *p*-values obtained were 0.137, 0.712, and 0.110, respectively.

These being higher than the 0.05 level of significance led to the rejection of the null hypothesis that there is no significant difference in the extent of utilization of computer-aided instruction among Grade 6 teachers in the area of hardware when grouped according to age, civil status, and length of service. This suggests that access to training, resources, and support for computer-aided instruction may be equitably distributed among teachers regardless of their personal background. The implication is that technological support systems within the schools in the district may have been effective in promoting equal opportunities for all teachers to integrate hardware into their instruction. It also indicates that institutional efforts such as standardized ICT training, provision of school-based resources, and shared access to hardware have helped bridge demographic gaps. As a result, teachers, whether new or experienced, married or single, young or older, are able to utilize available technology tools at comparable levels.

This study by Oducado et al. (2023) found no significant difference in ICT usage based on demographic variables. Although marital status showed some influence among Lower Secondary School teachers, it was not statistically significant among Public Elementary School teachers.

**Table 11**

*Difference in the Extent of Utilization of Computer-Aided Instruction of Teachers in the Area of Software When Grouped and Compared According to the Age, Civil Status, and Length of Service*

Variables	Categories	N	Mean Rank	Mann Whitney U - test	Sig. Level	p-value	Interpretation
Age	Younger	22	28.02	186.500	0.05	0.059	Not Significant
	Older	25	20.46				
Civil Status	Single	13	22.58	202.500	0.05	0.659	Not Significant
	Married	34	24.54				
Length of Service	Shorter	23	25.85	233.500	0.365	0.365	Not Significant
	Longer	24	22.23				

Table 11 presents the difference in the extent of computer-aided instruction utilization among Grade 6 teachers in the area of software, grouped and compared by age, civil status, and length of service. It can be noted from the Table that the *p*-values obtained were 0.059, 0.659, and 0.365, respectively. The values exceeding the 0.05 level of significance resulted in the rejection of the null hypothesis that there is no significant difference in the extent of utilization of computer-aided instruction among



Grade 6 teachers in the area of software when grouped according to age, civil status, and length of service. This finding suggests that these demographic factors do not substantially influence how teachers integrate educational software into their teaching, suggesting that, regardless of personal background or years of experience, teachers are equally capable of and likely to use software tools to support instruction. This further indicates that access to digital tools is consistently implemented across different teacher groups, fostering equal opportunities for technology integration in the classroom.

This lends support to the study by Keržič et al. (2021), which found no significant age-related differences in usage, suggesting that teachers, regardless of age or experience, demonstrate similar levels of software integration in instruction. On the other hand, the result contradicts that of Šumak et al. (2021), who found that software utilization in teaching is more influenced by teacher motivation, digital competence, and institutional support, rather than age, marital status, or tenure.

**Table 12**

*Relationship Between the Extent of Utilization of Computer-Aided Instruction by Teachers and the Level of Reading Proficiency of Learners*

Variables	r	Sig. Level	p-value	Interpretation
Extent of Utilization of Computer-Aided Instruction	0.002	0.05	0.987	Not Significant
Level of Reading Proficiency of Learners				

Table 12 illustrates the relationship between the extent of computer-aided instruction utilization by teachers and the level of reading proficiency among learners. As shown in the Table, the *p*-value obtained was 0.987, which is higher than the significance level of 0.05, indicating the acceptance of the null hypothesis. Therefore, there is no significant relationship between the extent of computer-aided instruction used by teachers and the reading proficiency level of learners.

These results indicate that the presence of CAI alone is insufficient to produce measurable gains in reading proficiency. It also highlights the importance of combining digital tools with effective pedagogical approaches, meaningful student engagement, and robust support systems to significantly impact reading achievement. Furthermore, the extent of computer-aided instruction utilization by teachers does not significantly impact the reading proficiency level of learners. It shows that while technology can help, other important factors also contribute to improving students' reading skills.

This finding supports that of Llamera and Ubayubay (2024), who found that while technology integration in classrooms was widespread, there was no significant relationship between teachers' practices and learners' reading performance, except when technical support and infrastructure were considered. On the other hand, this finding contradicts another study by Francisco and Madrazo (2016), which found that students who regularly engaged with both printed and electronic reading materials demonstrated average reading comprehension and satisfactory academic performance. Similarly, the finding contradicts that of Dujim et al. (2025), which showed a strong and positive correlation between students' weekly usage time of the software and improvements in reading fluency.

## CONCLUSION

The study found that most teacher-respondents were older, married, and had long years of service, yet consistently demonstrated a high extent of Computer-Aided Instruction (CAI) utilization across hardware and software, regardless of age, civil status, or length of service. Learners' reading proficiency was generally at the instructional level, indicating they could read with guidance but not independently. Despite widespread CAI use, statistical analysis showed no significant differences in CAI integration across demographic groups and no significant relationship between teachers' CAI utilization and learners' reading proficiency, suggesting that technology alone does not determine reading outcomes. The study concludes that although CAI is widely utilized by teachers, its impact on reading proficiency is not statistically significant when examined in isolation.

## RECOMMENDATIONS

Recommendations include expanding respondent groupings in future studies, providing division-wide training for multimedia CAI integration, directing teachers to incorporate phoneme review using CAI, and encouraging school heads to conduct quarterly reviews of instructional strategies to ensure a balanced and comprehensive approach to improving reading proficiency. Also, future studies may employ experimental or mixed methods designs to examine not only the extent, but also the quality and instructional alignment of CAI use. And lastly, Professional development initiatives should focus on pedagogically grounded CAI integration rather than frequency of use alone.



## Acknowledgment

All glory is offered to the Almighty Father for the guidance and strength that made this undertaking possible. Deep gratitude is extended to her adviser, panel members, and mentors whose support, encouragement, and expertise inspired the researcher throughout the completion of this work. Heartfelt appreciation is also given to her parents, husband, and children for their unwavering love, patience, and motivation, as well as to her family and friends whose support and kindness continually uplifted her and made this journey meaningful.

## Conflict of Interest

The authors affirm that there are no conflicts of interest concerning the conduct, authorship, or publication of this research. All procedures and interpretations were carried out independently, without any financial, professional, or personal factors influencing the study's results.

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