Assessing Digital Literacy of Public Elementary Teachers: Basis for Initiation of Training

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ABSTRACT

This study determined the level of digital literacy of public elementary school teachers in one of the divisions in Negros Island Region during the school year 2025–2026. Using a descriptive quantitative research design, the study involved 202 teachers selected through stratified random sampling. Data were gathered using a standardized questionnaire that assessed teachers' proficiency in basic computer commands, Microsoft Office applications, Google Apps, and other computer applications. Findings revealed that the respondents generally demonstrated a very high level of digital literacy, particularly in basic computer operations, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, and Google Apps. However, lower proficiency was observed in advanced multimedia and publishing applications. Significant differences in digital literacy were found when teachers were grouped according to age, sex, and highest educational attainment. Likewise, no significant relationships were found between digital literacy of teachers and their profile.

Keywords: Digital Literacy, Public Elementary School Teachers, Digital Competence, Computer Applications, Microsoft Office, Google Apps, Basic Computer Skills, Educational Technology, Teacher Proficiency, Digital Skills.

INTRODUCTION

The rapid integration of digital technologies into education has redefined the competencies expected of teachers worldwide, making digital literacy an essential component of effective teaching in the 21st century. Beyond basic technical skills, digital literacy now encompasses the ability to critically evaluate information, create digital content, and engage learners through technology-mediated instruction. The global shift toward digital education was further accelerated by the COVID-19 pandemic, which compelled educators to transition to online and blended learning environments. As a result, teachers are now expected to demonstrate adaptability and proficiency in various digital platforms to ensure continuity and quality of learning (Fernández-Márquez et al., 2022; Redecker & Punie, 2020). This transformation underscores the growing recognition that digital literacy is not optional but a core professional competency for educators across all levels.

In the international research landscape, digital literacy has increasingly been linked to pedagogical innovation and student engagement. Studies highlight that teachers with higher levels of digital literacy are more capable of designing interactive and learner-centered experiences, thereby improving educational outcomes. Moreover, digital competence frameworks, such as the European Digital Competence Framework for Educators, emphasize the integration of technological, pedagogical, and content knowledge as a holistic approach to teaching in digital environments (Ghomi & Redecker, 2019; Cabero-Almenara et al., 2021). Recent literature also points to the importance of continuous professional development, as digital tools and platforms evolve rapidly, requiring teachers to constantly update their skills and practices to remain effective in diverse learning contexts.

In the Philippine setting, the importance of digital literacy among public elementary teachers became more pronounced during the implementation of distance learning modalities. Many teachers encountered challenges related to limited access to technology, insufficient training, and varying levels of digital competence. While some educators were able to adapt through self-learning and peer collaboration, others struggled to integrate digital tools effectively into their teaching practices. Studies have shown that although Filipino teachers exhibit

resilience and commitment, gaps in digital literacy still affect instructional delivery and student engagement (Toquero, 2020; Lapada et al., 2020). These challenges highlight the need for structured support systems and targeted training programs that address the specific needs of teachers in the public education sector.

At the local level, particularly in public elementary schools, disparities in digital literacy are influenced by contextual factors such as school resources, administrative support, and teachers' prior exposure to technology. In many cases, professional development opportunities related to digital literacy are limited or not aligned with the actual needs of teachers. Consequently, teachers often rely on informal learning strategies, which may lead to inconsistent levels of competence across the faculty. This situation creates a gap between policy expectations and classroom realities, where the integration of technology remains uneven and, at times, ineffective (Trinidad, 2020; Guillén-Gámez et al., 2021). Such conditions emphasize the importance of conducting localized assessments to better understand teachers' digital literacy levels and training requirements.

Despite the growing body of literature on digital literacy, there is a lack of context-specific studies that directly inform the development of training programs for public elementary teachers. Many existing studies focus on general teacher populations or higher education, with limited attention given to grassroots-level needs assessment. This gap underscores the rationale for the present study, which aims to evaluate the digital literacy of public elementary teachers as a basis for initiating targeted training interventions. By grounding the study in actual school contexts, it seeks to provide practical insights that can guide the design of responsive and sustainable professional development programs, ultimately enhancing teaching effectiveness and supporting improved learning outcomes in the digital age.

METHODOLOGY

This study employed a quantitative descriptive-correlational research design to determine the level of digital literacy among public elementary school teachers and examine its association with selected profile variables. The respondents were 202 public elementary school teachers from one of the Schools Divisions in the Negros Island Region during Academic Year 2025–2026. From a reported population of 408 teachers, the sample was determined using Yamane's formula at a 0.05 margin of error. Proportionate stratified sampling was used to ensure representation from the identified schools, followed by simple random sampling in selecting individual respondents.

Data were collected using a standardized questionnaire adopted from Bayucca (2020), Teachers' Information and Communication Technology (ICT) Skills Assessment: Basis for a Comprehensive ICT Training Program. The instrument assessed digital literacy in seven areas: Basic Computer Commands, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft Publisher, Google Apps, and Other Computer Applications. Respondents rated their proficiency using a four-point scale ranging from 1 (Very Low) to 4 (Very High). The instrument was reviewed by five experts, and all items obtained a Content Validity Ratio of 1.00 based on Lawshe's (1975) procedure. Its reliability was established through Cronbach's alpha, which yielded 0.911, indicating high internal consistency.

Data collection was conducted after securing approval from the Schools Division Superintendent and coordination with the concerned school administrators. Respondents were informed of the study's purpose, voluntary participation, and confidentiality of their responses. The accomplished questionnaires were retrieved, checked, coded, and prepared for statistical analysis while maintaining the privacy and confidentiality of the respondents.

Descriptive and inferential statistical procedures were employed to analyze the data. Frequency and percentage were used to describe the respondents' profiles, while mean and standard deviation were used to determine the level of digital literacy. The Mann–Whitney U test and Kruskal–Wallis H test were used to determine significant differences in digital literacy when respondents were grouped according to their profile variables. The Chi-square test and Goodman–Kruskal's Gamma were employed to determine significant associations between digital literacy and the respondents' profile characteristics. Statistical decisions were based on the predetermined level of significance of the study.

RESULTS AND DISCUSSIONS

Demographic Profile of the Teachers

Table 2. Frequency and Percent Distribution of the Demographic Profile of Teachers.

Profile	Category	f	%
Age			
	21-30 years old	24	11.88
	31-40 years old	69	34.16
	41-50 years old	39	19.31
	51-60 years old	70	34.65
	61 years old and above	0	0.00
	Total	202	100
Sex			
	Male	28	13.86
	Female	174	86.14
	Total	202	100
Highest Educational Attainment			
	College Graduate	35	17.33
	with Masters Unit	101	50.00
	Master's Degree	59	29.21
	with Doctorate Unit	4	1.98
	Doctorate Degree	3	1.49
	Total	202	100
Number of Years in Service			
	Below 1 year	4	1.98
	1-5 years	33	16.34
	5-10 years	47	23.27
	10-20 years	64	31.68
	20 years and above	54	26.73
	Total	202	100
Teaching Position			
	Teacher I	64	31.68
	Teacher II	41	20.3
	Teacher III	67	33.17
	Master Teacher I	23	11.39
	Master Teacher II	7	3.47
	Master Teacher III	0	0.00
	Total	202	100

Table 2 presents the demographic characteristics of the 202 respondents in terms of age, sex, highest educational attainment, years in service, and teaching position.

In terms of age, the data show that the largest proportion of respondents belongs to the 51–60 years old group, with 70 individuals (34.65%), followed closely by those aged 31–40 years old with 69 (34.16%). Respondents aged 41–50 years old account for 39 (19.31%), while only 24 (11.88%) fall within the 21–30 years old range. No respondents were recorded in the 61 years old and above category. This pattern suggests that the teaching workforce in the sample is largely composed of mid- to late-career professionals.

This finding aligns with recent observations that many public-school systems are experiencing an aging workforce due to slower entry of younger teachers and increased retention of experienced educators (OECD, 2020).

With regard to sex, female respondents make up a substantial majority, numbering 174 (86.14%), compared to 28 males (13.86%). This indicates a clear gender imbalance in favor of females, which has been consistently noted in the teaching profession, particularly in basic education.

Studies have pointed out that teaching continues to attract more women due to sociocultural expectations and perceived alignment with caregiving roles (UNESCO, 2021).

In terms of highest educational attainment, half of the respondents (101 or 50.00%) have earned units toward a master's degree, while 59 (29.21%) have already completed their master's degree. Meanwhile, 35 (17.33%) are college graduates, and only a small number have pursued doctoral education, with 4 (1.98%) having doctorate units and 3 (1.49%) holding a doctorate degree. This suggests that while many teachers are actively engaged in graduate studies, relatively few have reached the highest level of academic qualification.

This trend reflects ongoing professional development efforts among teachers, as continuing education is often linked to career advancement and improved teaching effectiveness (Darling-Hammond et al., 2020).

Looking at years in service, the largest group of respondents has been in the profession for 10–20 years (64 or 31.68%), followed by those with 20 years and above (54 or 26.73%). Those with 5–10 years of service account for 47 (23.27%), while 33 (16.34%) have 1–5 years, and only 4 (1.98%) have less than one year of experience. This indicates that the majority of respondents are seasoned educators, which may contribute to stability and accumulated expertise within the institution.

Research suggests that teaching experience is strongly associated with classroom management skills and instructional competence (Kini & Podolsky, 2020).

In terms of teaching position, most respondents are classified as Teacher III (67 or 33.17%) and Teacher I (64 or 31.68%), followed by Teacher II (41 or 20.30%). A smaller proportion holds higher-ranking positions, with 23 (11.39%) as Master Teacher I and 7 (3.47%) as Master Teacher II, while none are categorized as Master Teacher III. This distribution implies that while many teachers have progressed within the rank-and-file positions, fewer have moved into more advanced or specialized roles.

This may reflect limited opportunities for promotion or the stringent requirements associated with higher teaching ranks (Department of Education, 2020).

Overall, the findings indicate that the respondents are predominantly experienced, female educators who are in the mid to late stages of their careers and are actively pursuing further academic qualifications.

Level of Digital Literacy of Teachers

Table 3. Level of Digital Literacy of Teachers.

Statements	Mean	SD	Interpretation
Basic Computer Commands	3.79	0.39	Very High
1. Starting shutting down the computer	3.94	0.24	Very High
2. Encoding data	3.77	0.49	Very High
3. Printing single documents	3.9	0.35	Very High
4. Printing tiled documents	3.73	0.53	Very High
5. Setting-up margins/orientation/paper size/column	3.77	0.56	Very High
6. Saving document manually and using shortcut keys	3.78	0.52	Very High
7. Copy, move and paste text/picture/document	3.81	0.49	Very High
8. Recovering text (bold italic, underline etc.)	3.77	0.55	Very High
9. Formatting text (bold, italic, underline, etc.	3.8	0.48	Very High
10. Inserting header/footer page number	3.62	0.67	Very High

Microsoft Word		3.71	0.48	Very High
	1. Changing font size/font style of test	3.87	0.4	Very High
	2. Inserting images/tables/charts/word arts	3.76	0.53	Very High
	3. Inserting bullets/numbers	3.72	0.59	Very High
	4. Using watermarks/page color/page borders	3.57	0.7	Very High
	Table 3 continuation…			
	5. Aligning text (align left, center, align right)	3.76	0.53	Very High
	6. Informs them about activities that affect employees	3.57	0.63	Very High
Microsoft Excel		3.44	0.67	Very High
	1. Emerging splitting cells	3.5	0.72	Very High
	2. Inserting images	3.6	0.68	Very High
	3. Formatting cells of number	3.38	0.77	Very High
	4. Filling a series of number	3.35	0.79	Very High
	5. Computing using a formula	3.2	0.86	High
	6. Sorting alphabetically/ascending/descending	3.47	0.73	Very High
	7. Inserting and deleting columns/rows	3.54	0.73	Very High
	8. Adding another worksheet/spreadsheet	3.43	0.81	Very High
	9. Renaming sheets	3.48	0.73	Very High
	10. Adjusting the width and height of cells	3.42	0.76	Very High
Microsoft PowerPoint		3.54	0.61	Very High
	1. Opening a new document	3.81	0.52	Very High
	2. Inserting a new slide	3.76	0.56	Very High
	3. Formatting background	3.6	0.71	Very High
	4. Inserting background	3.6	0.71	Very High
	5. Inserting images/shapes/tables/charts	3.65	0.65	Very High
	6. Formatting images/shapes/tables/charts	3.57	0.72	Very High
	7. Designing the slides	3.55	0.75	Very High
	8. Applying animations	3.47	0.75	Very High
	9. Applying hyperlinks	3.31	0.85	Very High
	10. Producing learning software (SIM,SLK)	3.1	0.89	High
Microsoft Publisher		3.26	0.76	Very High
	1. Creating a blank page	3.46	0.74	Very High
	2. Inserting images/textbooks/word art	3.41	0.78	Very High
	3. Inserting picture holder	3.28	0.84	Very High
	4. Changing templates	3.21	0.86	High
	5. Choosing a publication page	3.16	0.87	High
	6. Formatting publication	3.08	0.86	High
Google Apps		3.32	0.63	Very High
	1. Internet browsing	3.77	0.55	Very High
	2. Using email (reading and sending emails)	3.71	0.59	Very High
	3. Downloading and savings files from the internet	3.76	0.53	Very High
	4. Using chat rooms and forums (Facebooks, Twitter, Instagram)	3.54	0.75	Very High
	5. Publishing a personal blog	3.05	0.88	High

	6. Designing a web page or personal site	2.85	1.02	High
	7. Goggle-sheets	3.13	0.94	High
	8. Google drive	3.21	0.9	High
	9. Goggle scholar (research, articles, journals, publications)	2.83	0.98	High
Other Computer Applications		2.76	0.83	High
	1. Adobe Photoshop	2.54	0.98	High
	2. Power director	2.54	0.95	High
	3. Movie maker	2.62	0.97	High
	4. Windows media	2.6	0.96	High
	5. Acrobat reader	2.67	1	High
	6. Searching for saved data in USB or other storage	3.32	0.95	Very High
	7. Setting up a projector	3.05	1.01	High
Overall Mean		3.43	0.53	Very High
Legend: (3.26-4.00)-Very High; (2.51-3.25)-High; (1.76-2.50)-Low; (1.00-1.75)-Very Low				

Table 3 shows the mean of basic computer commands, (M = 3.79 SD = 0.39) reflects a very high level of proficiency. Tasks such as starting and shutting down the computer (M = 3.94, SD = 0.24), printing documents (M = 3.90, SD = 0.35), and formatting text (M = 3.80, SD = 0.48) were consistently rated very high. This suggests that teachers have already mastered routine computer operations that serve as the foundation for more advanced digital tasks.

This finding is consistent with recent studies emphasizing that basic digital literacy is now a standard competency among educators, particularly in technology-integrated learning environments (UNESCO, 2021).

For Microsoft Word, (M = 3.71, SD = 0.48) also falls under very high. Teachers showed strong ability in formatting text, inserting objects, and organizing documents.

These results indicate that teachers are well-equipped to prepare instructional materials and written outputs efficiently. According to Cabero-Almenara et al. (2020), proficiency in word processing tools remains one of the most essential digital competencies for educators, as it directly supports lesson planning and documentation.

In Microsoft Excel, (M = 3.44, SD = 0.67) was interpreted as very high, although slightly lower compared to other areas. Skills such as inserting images (M = 3.60, SD = 0.68) and managing worksheets (M = 3.43, SD = 0.81) were rated very high, while computing using formulas (M = 3.20, SD = 0.86) was rated high. This suggests that while teachers are comfortable with basic spreadsheet functions, more complex operations may still require further development.

This aligns with findings that spreadsheet-related skills are often more challenging for educators and may require targeted training (Scherer et al., 2021).

In terms of Microsoft PowerPoint, (M = 3.54, SD = 0.61) indicates very high proficiency. Teachers were particularly skilled in opening presentations (M = 3.81, SD = 0.52), inserting slides (M = 3.76, SD = 0.56), and adding visual elements such as images and shapes. These results suggest that teachers are capable of creating engaging visual presentations to support classroom instruction.

This supports the view that presentation tools enhance student engagement when used effectively (Haleem et al., 2022).

For Microsoft Publisher, (M = 3.26, SD = 0.76) was still within the very high range, although some tasks such as formatting publications (M = 3.08, SD = 0.86) and choosing layouts (M = 3.16, SD = 0.87) were rated high. This indicates moderate familiarity with layout and design tasks, suggesting that teachers may benefit from further exposure to publishing tools.

This finding aligns with studies showing that educators tend to have less experience with desktop publishing and design-oriented applications, as these are not as frequently integrated into daily teaching tasks compared to basic productivity software (Cabero-Almenara et al., 2020; Tondeur et al., 2021).

In Google applications, (M = 3.32, SD = 0.63) was interpreted as very high. Teachers demonstrated strong skills in browsing (M = 3.77, SD = 0.55), email use (M = 3.71, SD = 0.59), and downloading resources (M = 3.76, SD = 0.53). However, more advanced tasks such as designing web pages (M = 2.85, SD = 1.02) and using Google Scholar (M = 2.83, SD = 0.98) were rated high. This suggests that while teachers are confident in everyday online tasks, academic and content creation tools are less frequently utilized.

This is supported by recent research showing that teachers tend to be more proficient in communication tools than in content creation platforms (Bond et al., 2020).

Lastly, in other computer applications, (M = 2.76, SD = 0.83) was interpreted as high. Skills in software such as Adobe Photoshop (M = 2.54, SD = 0.98), Power Director (M = 2.54, SD = 0.95), and movie-making tools (M = 2.62, SD = 0.97) were rated high, indicating moderate familiarity. Meanwhile, tasks like searching files in storage devices (M = 3.32, SD = 0.95) reached very high. This suggests that teachers are less experienced with specialized multimedia and editing tools, which are often more technical in nature.

This observation is consistent with recent findings that educators tend to demonstrate lower confidence and competence in advanced digital applications compared to basic productivity and communication tools (Falloon, 2020; Redecker, 2021).

The overall mean of the respondents demonstrated a very high level of digital literacy (M = 3.43, SD = 0.53), indicating that most teachers are already confident in using essential digital tools required for instruction and administrative tasks.

Difference in the Digital Literacy of Teachers when they are grouped according to Age

Table 4a. Difference in the Digital Literacy of Teachers when they are grouped according to Age.

Age	Test Statistics (H)	p-value	Decision for H_o	Interpretation
21-30 years old	8.359	0.039	Reject H_o	Significant
31-40 years old				
41-50 years old				
51-60 years old				

Table 4a presents the results of the Kruskal–Wallis test used to examine whether there is a significant difference in the digital literacy of teachers when grouped according to age. The analysis yielded a test statistic of (H = 8.359, p = 0.039). Since the p-value is less than the 0.05 level of significance, the null hypothesis was rejected. This indicates that there is a significant difference in digital literacy levels across the different age groups. Therefore, age plays a role in influencing the level of digital literacy among the respondents.

This observation is consistent with the study of König et al. (2020), which found that younger educators tend to demonstrate higher confidence in using digital tools due to greater exposure to technology-rich environments. Similarly, Scherer et al. (2021) reported that age can influence digital competence, particularly in terms of adaptability and frequency of technology use in instructional settings.

Table 4a.1. Pairwise Comparison between Age.

Age	Test Statistic	p-value	Interpretation
21-30 years old vs 31-40 years old	-13.772	0.320	Not Significant
21-30 years old vs 41-50 years old	-30.006	0.048	Significant

21-30 years old vs 51-60 years old	1.676	0.903	Not Significant
31-40 years old vs 41-50 years old	-16.235	0.165	Not Significant
31-40 years old vs 51-60 years old	15.448	0.119	Not Significant
41-50 years old vs 51-60 years old	31.683	0.007	Significant

Table 4a.1 shows the pairwise comparisons of age groups revealed that most differences were not statistically significant, as indicated by p-values greater than the conventional alpha level of .05. Specifically, comparisons between individuals aged 51–60 years old and those aged 21–30 years old (p = 0.903) and 31–40 years old (p = 0.119) showed no significant differences, suggesting comparable responses across these groups. Similarly, no significant difference was observed between the 21–30 years old and 31–40 years old age groups (p = 0.320), as well as between the 31–40 years old and 41–50 years old groups (p = 0.165).

However, statistically significant differences emerged in two comparisons. The group aged 51–60 years old differed significantly from those aged 41–50 years old (p = 0.007), and the 21–30 years old group also differed significantly from the 41–50 years old group (p = 0.048). These findings indicate that the 41–50 years old age group may exhibit distinct characteristics or responses compared to both younger and older cohorts. Overall, the results suggest that while age-related differences are generally minimal, specific age brackets, particularly the 41–50 years old group, may demonstrate unique patterns that warrant further consideration.

This pattern may imply that individuals within the 41–50 age bracket are influenced by unique life or professional circumstances that shape their responses differently. As such, interventions, programs, or policies may benefit from being more responsive to the specific needs of this group rather than applying a one-size-fits-all approach. Recognizing these subtle differences can improve the effectiveness of decision-making and targeted strategies in practice.

The findings reinforce the importance of examining subgroup variations even when overall differences appear minimal, as meaningful distinctions may still emerge within specific categories. Future studies may further explore underlying factors that contribute to these differences to provide a deeper understanding of age-related dynamics (Field, 2020; Kim & Choi, 2021).

Difference in the Digital Literacy of Teachers when they are grouped according to Sex

Table 4b. Difference in the Digital Literacy of Teachers when they are grouped according to Sex.

Sex	**Test Statistics (U)**	**p-value**	**Decision for H_o**	**Interpretation**
Male Female	1432.000	<0.001	Reject H_o	Significant

Table 4b presents the results of the Mann–Whitney U test examining the difference in digital literacy of teachers when grouped according to sex. The analysis yielded a test statistic of (U = 1432.000, p = <0.001). Since the p-value is lower than the 0.05 level of significance, the null hypothesis was rejected. This indicates that there is a statistically significant difference in the digital literacy of teachers when grouped according to sex.

The result suggests that one group (either male or female teachers) demonstrates a higher level of digital literacy compared to the other. This difference may be influenced by varying levels of exposure, training opportunities, or confidence in using digital tools.

This finding is supported by recent studies showing that differences in digital literacy skills may still exist between male and female educators, particularly in terms of confidence and frequency of technology use, even though access to digital resources has improved (Scherer et al., 2021; Yazon et al., 2022).

Difference in the Digital Literacy of Teachers when they are grouped according to Highest Educational Attainment

Table 4c. Difference in the digital literacy of Teachers when they are grouped according to Highest Educational Attainment.

Highest Educational Attainment	Test Statistics (H)	p-value	Decision for H_o	Interpretation
College Graduate with Masters Unit Master's Degree with Doctorate Unit Doctorate Degree	18.390	0.001	Reject Ho	Significant

Table 4c presents the results of the Kruskal–Wallis test examining the difference in digital literacy of teachers when grouped according to highest educational attainment. The analysis yielded a test statistic of (H = 18.390, p = 0.001). Since the p-value is less than the 0.05 level of significance, the null hypothesis was rejected. This indicates that there is a statistically significant difference in the digital literacy of teachers when they are grouped according to highest educational attainment.

The result suggests that teachers with varying levels of educational attainment demonstrate differing levels of digital literacy. In particular, those who have pursued advanced studies (e.g., master's or doctoral levels) may exhibit higher digital literacy compared to those with only a college degree. This difference may be attributed to increased exposure to research, academic technologies, and professional development opportunities commonly encountered in higher levels of education.

These findings are supported by recent studies which emphasize that higher educational attainment is often associated with stronger digital competence, as advanced academic work typically requires more frequent and complex use of technology (Scherer et al., 2021; Tondeur et al., 2020).

Table 4c.1. Pairwise Comparison between Highest Educational Attainment.

Highest Educational Attainment	Test Statistic	p-value	Interpretation
College Graduate vs with Masters Unit	-41.316	<0.001	Significant
College Graduate vs Master's Degree	-45.623	<0.001	Significant
College Graduate vs with Doctorate Unit	-81.386	0.008	Significant
College Graduate vs Doctorate Degree	-53.219	0.130	Not Significant
with Masters Unit vs Master's Degree	-4.307	0.653	Not Significant
with Masters Unit vs with Doctorate Unit	-40.069	0.179	Not Significant
with Masters Unit vs Doctorate Degree	-11.903	0.728	Not Significant
Master's Degree vs with Doctorate Unit	-35.763	0.236	Not Significant
Master's Degree vs Doctorate Degree	-7.596	0.826	Not Significant
Doctorate Degree vs with Doctorate Unit	28.167	0.528	Not Significant

Table 4c.1 shows the pairwise comparisons were conducted to further examine the differences in digital literacy among teachers when grouped according to highest educational attainment. The results revealed that teachers who are college graduates differed significantly from those with master's units (p = <0 .001), those with a master's degree (p = < 0.001), and those with doctorate units (p = 0.008). These findings indicate that teachers who have pursued graduate-level education tend to demonstrate higher digital literacy compared to those with only a college degree.

However, no significant difference was found between college graduates and those with a doctorate degree (p = 0.130), suggesting that the level of digital literacy between these two groups may be comparable. Additionally, comparisons among the groups with graduate-level qualifications—such as with master's units versus master's degree (p = 0.653), with master's units versus doctorate degree (p = 0.728), and master's degree versus doctorate

degree (p = 0.826)—showed no statistically significant differences. Similar non-significant results were observed in comparisons involving doctorate units.

Overall, the findings suggest that meaningful differences in digital literacy are primarily observed between college graduates and those who have begun or are engaged in graduate studies, while differences among higher educational levels are minimal. This pattern implies that initial exposure to advanced academic training may contribute more substantially to digital literacy development than the completion of higher degrees alone.

These results are consistent with recent research indicating that engagement in graduate education enhances teachers' digital competence due to increased exposure to research tools, online platforms, and technology-integrated learning environments (Scherer et al., 2021; Tondeur et al., 2020).

Difference in the Digital Literacy of Teachers when they are grouped according to Number of Years in Service

Table 4d. Difference in the Digital Literacy of Teachers when they are grouped according to Number of Years in Service.

Number of Years in Service	Test Statistics (H)	p-value	Decision for H_o	Interpretation
Below 1 year	9.468	0.05	Reject H_o	Significant
1-5 years				
5-10 years				
10-20 years				
20 years and above				

Table 4d presents the results of the Kruskal–Wallis test examining the difference in teachers' digital literacy when grouped according to number of years in service. The analysis yielded a test statistic of H = 9.468 with a p-value of 0.050. Since the p-value is exactly equal to the 0.05 level of significance, the result is considered borderline or marginally significant. Following the conventional criterion of $p < 0.05$ for statistical significance, the null hypothesis is not rejected. Thus, there is insufficient evidence to conclude that a statistically significant difference exists in the digital literacy of teachers when grouped according to their number of years in service. However, the borderline p-value suggests that years of service may warrant further investigation as a possible factor associated with differences in teachers' digital literacy.

The result indicates that teachers' length of service may be related to variations in their familiarity, confidence, and adaptability in using digital technologies, although the evidence in the present study does not meet the strict criterion for statistical significance. Teachers with fewer years of service may have had greater exposure to recent digital technologies during their pre-service preparation, while more experienced teachers may have developed their digital skills through continuing professional development, workplace experience, and training. These possible differences highlight the importance of providing continuous and inclusive digital skills training that considers teachers' varying levels of experience and technology exposure.

The findings are consistent with recent literature emphasizing that teachers' professional experience may be associated with differences in technology integration and digital competence. However, the relationship between years of teaching experience and digital technology use is not necessarily uniform, as teachers' digital skills may also be influenced by access to technology, professional development opportunities, and the school context (Scherer et al., 2021; Tondeur et al., 2020). Therefore, the borderline result obtained in the present study should be interpreted with caution and may serve as a basis for further investigation.

Difference in the Digital Literacy of Teachers when they are grouped according to Teaching Position

Table 4e. Difference in the Digital Literacy of Teachers when they are grouped according to Teaching Position.

Teaching Position	Test Statistics (H)	p-value	Decision for H_o	Interpretation
Teacher I	9.527	0.049	Reject Ho	Significant
Teacher II				
Teacher III				
Master Teacher I				
Master Teacher II				

Table 8 presents the results of the Kruskal–Wallis test examining the difference in digital literacy of teachers when grouped according to teaching position. The analysis yielded a test statistic of (H = 9.527, p = 0.049). Since the p-value is slightly lower than the 0.05 level of significance, the null hypothesis was rejected. This indicates that there is a statistically significant difference in the digital literacy of teachers when they are grouped according to teaching position.

The result suggests that teachers occupying different positions—ranging from Teacher I to Master Teacher levels, demonstrate varying levels of digital literacy. This variation may be associated with differences in roles, responsibilities, and professional expectations. Higher teaching positions may require greater engagement in instructional leadership, mentoring, and the integration of technology in teaching, which can contribute to enhanced digital literacy.

The findings are supported by recent studies which emphasize that professional roles and responsibilities influence teachers' use of technology, with those in more advanced positions often demonstrating higher levels of digital integration and competence due to increased exposure and training opportunities (Tondeur et al., 2020; Scherer et al., 2021).

Table 4e.1. Pairwise Comparison between Teaching Position.

Teaching Position	p-value	Decision for Ho	Interpretation
Teacher I vs Teacher II	-24.501	0.036	Significant
Teacher I vs Teacher III	-26.763	0.009	Significant
Teacher I vs Master Teacher I	-32.193	0.023	Significant
Teacher I vs Master Teacher II	-24.581	0.291	Not Significant
Teacher II vs Teacher III	-2.261	0.845	Not Significant
Teacher II vs Master Teacher I	-7.692	0.613	Not Significant
Teacher II vs Master Teacher II	-.080	0.997	Not Significant
Teacher III vs Master Teacher I	-5.431	0.701	Not Significant
Teacher III vs Master Teacher II	2.181	0.925	Not Significant
Master Teacher I vs Master Teacher II	7.612	0.763	Not Significant

Table 8a presents the pairwise comparisons were conducted to identify specific differences in digital literacy among teachers when grouped according to teaching position. The results revealed several statistically significant differences. Teacher I differed significantly from Teacher II (p = 0.036), Teacher III (p = 0.009), and Master Teacher I (p = 0.023). These findings indicate that Teacher I's digital literacy is significantly different compared to these groups, suggesting variation in digital literacy at the entry-level position.

In contrast, no significant difference was found between Teacher I and Master Teacher II (p = 0.291), indicating comparable digital literacy levels between these two groups. Likewise, all other comparisons involving Teacher II, Teacher III, Master Teacher I, and Master Teacher II yielded non-significant results (p > 0.05), suggesting relatively similar digital literacy among these positions.

Overall, the results imply that significant differences in digital literacy are primarily concentrated between Teacher I and selected higher or mid-level positions, while most comparisons among other teaching positions show no meaningful variation. This pattern suggests that digital literacy may improve or stabilize after the initial teaching position, likely due to increased experience, exposure to training, and integration of technology in instructional practice.

These findings align with recent studies indicating that digital literacy tends to vary across professional roles, particularly between novice teachers and those with more established teaching experience, while differences among higher positions are often minimal due to shared professional development opportunities (Scherer et al., 2021; Tondeur et al., 2020).

Relationship in the Digital Literacy of Teachers when they are grouped according to Age

Table 5a. Relationship in the Digital Literacy of Teachers when they are grouped according to Age.

Variable	Test Statistics (G)	p-value	Decision for H_o	Interpretation
Digital Literacy vs. Age	0.217	0.065	Fail to Reject H_o	Not Significant

Table 5a presents the relationship between teachers' digital literacy and age using the Gamma coefficient. The analysis yielded a ($G = 0.217$, $p = 0.065$). Since the p-value is greater than the 0.05 level of significance, the null hypothesis was failed to rejected. This indicates that there is no significant relationship between digital literacy and age among the teachers.

The result suggests that age does not meaningfully influence digital literacy. Teachers across different age groups appear to demonstrate relatively similar levels of digital literacy, indicating that both younger and older teachers are equally capable of adapting to and utilizing technology in their teaching practices. This may reflect the increasing accessibility of digital literacy training, institutional support, and the growing integration of technology in education, which help minimize age-related gaps in digital competence.

The findings are consistent with recent research suggesting that age is no longer a strong determinant of digital literacy among educators, as other factors such as training exposure, institutional support, and motivation play a more significant role in shaping digital skills (Tondeur et al., 2020; Scherer et al., 2021).

Relationship in the Digital Literacy of Teachers when they are grouped according to Sex

Table 5b. Relationship in the Digital Literacy of Teachers when they are grouped according to Sex.

Variable	Test Statistics (x^2)	p-value	Decision for H_o	Interpretation
Digital Literacy vs. Sex	4.657	0 .199	Fail to Reject H_o	Not Significant

Table 5b presents the relationship between teachers' digital literacy and sex using the chi-square test. The analysis yielded a chi-square value of ($\chi^2 = 4.657$, $p = 0$ .199). Since the p-value is greater than the 0.05 level of significance, the null hypothesis was failed to rejected. This indicates that there is no significant relationship between digital literacy and sex among the respondents.

The result suggests that male and female teachers demonstrate comparable levels of digital literacy. This implies that sex does not play a determining role in the development or application of digital literacy in teaching. Both groups appear to have similar access to digital literacy training, resources, and opportunities, which may have contributed to the equalization of digital skills regardless of sex.

This finding is consistent with recent studies indicating that gender differences in digital literacy among educators have diminished over time, as both male and female teachers increasingly participate in digital learning environments and professional development programs (Scherer et al., 2021; Yazon et al., 2022).

Relationship in the Digital Literacy of Teachers when they are grouped according to Highest Educational Attainment

Table 5c. Relationship in the Digital Literacy of Teachers when they are grouped according to Highest Educational Attainment.

Variable	Test Statistics (G)	p-value	Decision for H_o	Interpretation
Digital Literacy vs. Highest Educational Attainment	-0.234	0 .053	Fail to Reject H_o	Not Significant

Table 5c presents the relationship between teachers' digital literacy and highest educational attainment using the Gamma coefficient. The analysis yielded a (G= -0.234, p = 0 .053). Since the p-value is greater than the 0.05 level of significance, the null hypothesis was not rejected. This indicates that there is no significant relationship between digital literacy and highest educational attainment among the respondents.

The result implies that teachers' digital literacy does not vary significantly based on their academic degree. Whether teachers are college graduates or have advanced graduate units or degrees, their digital literacy appear to be relatively similar. This suggests that formal educational attainment alone is not a strong predictor of digital literacy proficiency. Instead, digital literacy competence may be more influenced by actual exposure to technology, participation in training programs, and continuous use of digital tools in teaching practice.

This finding is consistent with recent studies emphasizing that digital literacy among teachers is shaped more by ongoing professional development and practical experience than by academic qualifications alone (Tondeur et al., 2020; Scherer et al., 2021).

Relationship in the Digital Literacy of Teachers when they are grouped according to Number of Years in Service

Table 5d. Relationship in the Digital Literacy of Teachers when they are grouped according to Number of Years in Service.

Variable	Test Statistics (G)	p-value	Decision for H_o	Interpretation
Digital Literacy vs. Number of Years in Service	0.203	0.062	Fail to Reject Ho	Not Significant

Table 5d presents the relationship between teachers' digital literacy and number of years in service using the Gamma coefficient. The analysis yielded a Gamma coefficient of (G = 0.203, p = 0.062). Since the p-value is greater than the 0.05 level of significance, the null hypothesis was not rejected. This indicates that there is no significant relationship between teachers' digital literacy and number of years in service. Although the positive Gamma coefficient suggests a slight tendency for digital literacy to increase as teachers' years in service increase, the relationship is not statistically significant. Thus, the number of years that teachers have been in the profession does not appear to be a meaningful factor in determining their level of digital literacy. This finding implies that teachers with fewer years of service and those who have been in the profession for a longer period may demonstrate relatively comparable levels of digital literacy. The result may indicate that digital competence is developed not only through length of professional experience but also through exposure to technology,

participation in training, personal motivation, and opportunities to use digital tools in actual teaching situations. In practice, schools should therefore avoid assuming that experienced teachers are automatically more digitally literate or that newer teachers necessarily possess stronger digital skills. Instead, digital literacy programs should be based on the specific competency needs of teachers and should provide continuous, practical, and accessible professional development opportunities for all teachers, regardless of their years in service.

The finding is consistent with recent research emphasizing that teachers' digital competence is shaped by multiple professional and contextual factors, including opportunities for professional learning, access to technology, self-efficacy, and institutional support, rather than by teaching experience alone (Falloon, 2020; Scherer et al., 2021). This result highlights the importance of providing sustained and inclusive digital professional development that enables teachers at every stage of their careers to strengthen their digital literacy and effectively integrate technology into teaching and learning.

Relationship between Digital Literacy of Teachers and Teaching Position

Table 5e. Relationship between Digital Literacy of Teachers and Teaching Position.

Variable	Test Statistics (G)	p-value	Decision for H_o	Interpretation
Digital Literacy vs. Teaching Position	15.556	0.212	Fail to Reject Ho	Not Significant

Table 13 presents the relationship between teachers' digital literacy and teaching position. A Gamma coefficient test was conducted to determine whether teaching position is significantly associated with digital literacy. The analysis yielded a ($G = 15.556$, $p = 0.212$). Since the p-value is greater than the 0.05 level of significance, the null hypothesis was not rejected. This indicates that there is no significant relationship between digital literacy and teaching position among the respondents.

The result suggests that digital literacy competence does not significantly vary across different teaching positions such as Teacher I, Teacher II, Teacher III, and Master Teacher levels. This implies that teachers, regardless of rank, tend to demonstrate relatively similar levels of digital literacy. This may be attributed to standardized digital literacy training programs, equal access to professional development opportunities, and the widespread integration of digital tools in teaching across all career levels.

This finding aligns with recent studies emphasizing that digital literacy competence among educators is more strongly influenced by continuous professional development and exposure to technology rather than formal position or rank within the school system (Tondeur et al., 2020; Scherer et al., 2021).

CONCLUSIONS

Based on the findings of the study, the following conclusions were formulated:

The respondents are largely composed of experienced, mid- to late-career female teachers, most of whom have served for more than ten years and hold Teacher I to Teacher III positions.

Teachers demonstrate a very high level of digital literacy, particularly in basic operations and commonly used applications such as Microsoft Office and Google tools.

Digital literacy of teachers varies significantly when grouped according to age, sex, highest educational attainment, years in service, and teaching position.

Teachers' digital literacy are not influenced by their age, sex, highest educational attainment, years in service, or teaching position.

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