



Barangay ICT Literacy Assessment: Understanding the Community's Digital Needs

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Abstract

This study assessed the Information and Communication Technology (ICT) literacy of the Barangay Camingawan workforce in Kabankalan City, Negros Occidental to determine their digital competencies and identify areas requiring capacity development. A mixed-methods needs assessment was conducted among 41 barangay personnel, including barangay officials, secretaries, treasurers, clerks, barangay health workers, child development workers, a midwife, and Violence Against Women and Children (VAW-C) officers. Quantitative data were collected using a structured questionnaire that measured competencies in basic computer operations, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, internet use, and access to digital resources. Qualitative information from face-to-face interviews supplemented the survey by identifying participants' perceived training needs. Descriptive statistics and thematic analysis were used to analyze the data. The findings indicate limited ICT competence among the respondents, characterized by inadequate access to computers and reliable internet connectivity, minimal participation in formal ICT training, and low proficiency in fundamental computer concepts and Microsoft Office applications. Despite these limitations, most participants recognized the importance of ICT skills in improving administrative efficiency and public service delivery. The study concludes that a structured, context-specific ICT capability-building program is necessary to strengthen the digital competencies of barangay personnel. It recommends implementing progressive training modules focusing on basic computer operations, productivity software, and practical digital applications relevant to barangay governance and public service.

Keywords

ICT literacy, barangay workforce, digital competency, Microsoft Office, local government

How to Cite

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Author Contributions

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Ethics Statement

This study was conducted in accordance with ethical standards.

INTRODUCTION

Information and Communication Technology (ICT) has become an essential component of modern governance, enabling government institutions to improve administrative efficiency, communication, information management, and public service delivery. As digital transformation continues across public institutions, local government units are increasingly expected to

integrate digital technologies into routine administrative processes. Consequently, ICT literacy has become a fundamental competency for government personnel responsible for documentation, records management, reporting, and citizen engagement. Digital competence extends beyond access to technology and encompasses the knowledge and skills required to effectively utilize productivity software, communication platforms, and digital information resources in accomplishing organizational tasks (Alvero et al., 2025; Ferranco et al., 2025).

At the local government level, barangay personnel serve as frontline public servants responsible for implementing government programs and delivering essential community services. Their daily responsibilities require the preparation of reports, management of records, financial documentation, and communication with various government agencies through digital platforms. However, many rural barangays continue to experience challenges associated with limited ICT infrastructure, inadequate access to computers and reliable internet connectivity, and insufficient opportunities for digital skills development. These limitations reduce administrative efficiency and hinder the effective implementation of digital governance initiatives. Moreover, the successful adoption of digital technologies depends not only on the availability of digital resources but also on the competency and readiness of personnel to utilize these technologies effectively (Albarillo et al., 2022; Budiarto et al., 2024).

Previous studies have examined ICT adoption and digital readiness among local government personnel; however, important research gaps remain. Existing investigations have primarily focused on urban communities or broad national assessments, providing limited empirical evidence regarding ICT competencies among barangay personnel in rural settings. Furthermore, several studies have emphasized access to technology without sufficiently examining the relationship between technology access, actual digital competence, and workplace application. Standardized ICT assessment tools also tend to overlook the contextual realities and operational responsibilities unique to rural barangays, thereby limiting their usefulness in developing localized ICT capability-building programs (Alvero et al., 2025; Nodado et al., 2024). These limitations highlight the need for community-based ICT assessments that generate context-specific evidence to support digital transformation initiatives at the grassroots level.

Accordingly, this study assessed the ICT literacy of the Barangay Camingawan workforce by examining their competencies in basic computer operations, Microsoft Office applications, internet utilization, and digital resource accessibility. Specifically, it aimed to determine the respondents' current level of ICT literacy, identify competency gaps, and provide evidence-based recommendations for community-responsive ICT capability-building programs. The findings are expected to contribute to strengthening digital governance, improving administrative efficiency, and supporting evidence-informed planning for digital transformation in local government units. By generating localized evidence on ICT readiness, the study provides practical insights for designing responsive capacity-building interventions that enhance workforce competencies, promote inclusive digital transformation, and improve the quality of public service delivery at the grassroots level.

METHODOLOGY

Design

This study employed a mixed-methods descriptive research design to assess the Information and Communication Technology (ICT) literacy of the barangay workforce. Quantitative data were collected through a structured questionnaire to evaluate respondents' competencies in basic computer concepts, Microsoft Office applications, internet utilization, and access to digital resources, while qualitative data were gathered through face-to-face interviews to identify their experiences and ICT training needs. The integration of both methods provided a comprehensive assessment of the respondents' digital competencies and informed the development of appropriate capacity-building interventions.

Locale

The study was conducted in Barangay Camingawan, Kabankalan City, Negros Occidental, Philippines. Prior to data collection, representatives from the College of Computer Studies of Central Philippines State University visited the barangay to conduct a consultative meeting with the barangay officials regarding the planned ICT literacy needs assessment. The barangay was selected because of its interest in improving the digital competencies of its workforce and strengthening the delivery of public services through technology integration.

Respondents and Sampling

The respondents consisted of 41 active barangay personnel from Barangay Camingawan, including barangay officials, the barangay secretary, barangay treasurer, barangay health workers, child development workers, barangay nutrition scholars, a midwife, a barangay paravet, and a Violence Against Women and Children (VAW-C) officer. Purposive sampling was employed to select respondents directly involved in barangay administration and community service, as they were the primary target of the ICT literacy assessment.

Instrument

Data were collected using a researcher-developed structured questionnaire administered by the Extension Coordinator of the College of Computer Studies. The questionnaire consisted of both closed-ended and open-ended questions designed to assess the respondents' ICT literacy and digital resource availability. The instrument covered key domains, including access to digital resources, knowledge of basic computer concepts, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, and internet utilization for work-related activities. The questionnaire was supplemented by a semi-structured interview guide to gather qualitative information regarding the respondents' experiences, challenges, and perceived ICT training needs.

Collection

A face-to-face interview was initially conducted with the barangay workforce to identify their digital skill needs and determine the ICT competencies they considered essential in performing their duties. During the interviews, participants

explained the importance of acquiring digital skills to keep pace with technology-driven administrative processes and reporting requirements. With the respondents' consent, the discussions were documented through note-taking to ensure the accuracy of the information collected. Following the preliminary interviews, the structured survey questionnaire was administered to all participants. The questionnaires were personally distributed and retrieved by the researchers to ensure complete responses. Data collection was conducted after securing the cooperation of the barangay officials and obtaining the voluntary participation of all respondents.

Analysis

The study employed both quantitative and qualitative methods in analyzing the collected data. Quantitative data obtained from the survey questionnaires were analyzed using descriptive statistics, including frequencies, percentages, and arithmetic means, to summarize the respondents' demographic characteristics, ICT resource availability, and competency levels. Cross-tabulation was likewise employed to examine relationships among selected variables associated with ICT utilization. Qualitative data gathered through face-to-face interviews were transcribed and analyzed using thematic analysis. A coding framework was applied to identify recurring themes and patterns regarding participants' experiences, challenges, and perceived skill gaps related to digitalization. This approach enabled the researchers to integrate numerical findings with participants' perspectives, thereby providing a more comprehensive interpretation of the results. The competency levels were interpreted using the researcher-developed rating scale, wherein scores ranging from 1.00–1.80 indicated no competence, 1.81–2.60 indicated basic competence, 2.61–3.40 indicated moderate competence, 3.41–4.20 indicated advanced competence, and 4.21–5.00 indicated expert competence.

Ethical Considerations

Ethical standards were observed throughout the conduct of the study. A Memorandum of Agreement (MOA) between Barangay Camingawan and Central Philippines State University–College of Computer Studies was established prior to the implementation of the research and was reviewed by the University's Legal Office. Participation in the study was voluntary, and respondents were informed of the objectives and procedures of the research before data collection commenced. Participants provided their consent before completing the questionnaire and participating in the interviews. Confidentiality and anonymity of all responses were maintained throughout the research process, and the information collected was used solely for academic and research purposes.

Limitations and Rigor

The study was limited to the ICT literacy assessment of 41 barangay personnel from Barangay Camingawan, Kabankalan City. Consequently, the findings reflect the specific context of the participating barangay and may not be generalized to other local government units. In addition, the assessment relied primarily on self-reported responses, which may be influenced by participants' perceptions of their competencies. Nevertheless, the credibility of the findings was strengthened through the integration of quantitative and qualitative data, the consistent administration of research instruments, and the systematic analysis of survey and interview responses. The mixed-methods approach enabled the researchers to validate quantitative findings using qualitative evidence, thereby providing a more comprehensive assessment of the ICT literacy needs of the barangay workforce.

RESULTS AND DISCUSSION

Table 1 summarizes the demographic characteristics of the respondents. The findings indicate that the Barangay Camingawan workforce is predominantly composed of middle-aged, female, and married personnel with varying educational backgrounds and several years of service in the barangay. Most respondents were between 26 and 50 years old, suggesting that the workforce consists primarily of individuals in their productive working years who possess substantial professional experience. In addition, the majority of respondents were college or vocational graduates, indicating that they have an adequate educational foundation to acquire ICT competencies through structured capacity-building programs. More than half of the respondents had served the barangay for three to six years, reflecting a workforce with sufficient institutional knowledge and familiarity with local government operations.

These demographic characteristics suggest that the respondents possess the educational qualifications and work experience necessary to benefit from ICT training initiatives. Previous studies have emphasized that workforce characteristics such as educational attainment, work experience, and organizational support influence the successful adoption of digital technologies within local government institutions (Ferranco et al., 2025; Calibo-Senit, 2026). Likewise, strengthening the ICT competencies of experienced barangay personnel can improve administrative efficiency, enhance public service delivery, and support the implementation of digital governance initiatives (Alvero et al., 2025). Therefore, the demographic profile indicates a favorable foundation for implementing community-based ICT capability-building programs, provided that adequate training opportunities and digital resources are made available.

Table 1
Demographic Profile of the Respondents (N = 41)

Variable	Category	Frequency	Percentage (%)
Age	18–25 years	5	12.20
	26–35 years	16	39.02
	36–50 years	16	39.02
	51 years and above	4	9.76
Sex	Male	5	12.20
	Female	36	87.80
Marital Status	Single	11	26.83

Variable	Category	Frequency	Percentage (%)
Educational Attainment	Married	27	65.85
	Widowed	3	7.32
	High School Graduate	8	19.51
	Undergraduate	7	17.07
	Vocational Graduate	10	24.39
	College Graduate	15	36.59
	Postgraduate	1	2.44
Position	Barangay Officials	9	21.95
	Barangay Health Workers	14	34.15
	Child Development Workers	12	29.27
	Barangay Nutrition Scholar	1	2.44
	Barangay Secretary	1	2.44
	Barangay Treasurer	1	2.44
	Midwife	1	2.44
	Barangay Paravet	1	2.44
	VAW-C Officer	1	2.44
Length of Service	1–3 years	8	19.51
	3–6 years	22	53.66
	6–9 years	11	26.83
Gross Monthly Income	₱4,000 and below	7	17.07
	₱4,001–₱8,000	23	56.10
	₱8,001 and above	11	26.83

Note. N = 41 respondents. Percentages may not total exactly 100% because of rounding.

Table 2 presents the respondents' level of competency in basic computer concepts. The overall mean score of 1.60 indicates no competence, suggesting that the barangay workforce has limited foundational computer knowledge necessary for effective digital administration. Respondents demonstrated relatively higher competency in performing routine tasks such as turning on the computer, properly shutting it down, and printing documents. However, lower competency was observed in identifying components of the Windows operating environment, distinguishing operating system software from application software, navigating multiple application windows, and recognizing different file formats. These findings indicate that respondents possess only basic operational familiarity but lack the conceptual understanding needed to perform more complex computer-related tasks.

The low competency level may be attributed to limited access to computers, insufficient exposure to digital technologies, and the lack of formal ICT training among respondents. Foundational computer skills are essential because they provide the basis for developing proficiency in productivity applications and other digital technologies commonly used in government offices. Similar studies have reported that barangay personnel and rural communities often exhibit limited computer literacy due to inadequate ICT infrastructure and limited training opportunities (Ferranco et al., 2025; Nodado et al., 2024). Likewise, digital transformation initiatives become more effective when organizations first strengthen employees' basic digital competencies before introducing advanced applications (Budiarto et al., 2024). These findings suggest that future ICT capability-building programs should initially focus on basic computer operations, file management, Windows navigation, and digital terminology. Establishing these competencies will provide a strong foundation for enhancing productivity software skills and supporting the implementation of digital governance initiatives within the barangay.

Table 2
Knowledge of Basic Computer Concepts (N = 41)

Basic Computer Concepts	Total	Mean
Turn on the computer and launch specific preloaded programs from the Desktop Icon or Menu Bar	89	2.17
Exit/quit an application and/or file and shut the computer properly	76	1.85
Navigate toolbars, windows, menus, submenus, tabs, and dialog boxes	61	1.49
Select appropriate software (word processor, presentation, browser, database, spreadsheet, etc.) for the task	62	1.51
Insert and eject CD-ROMs and USB drives properly	72	1.76
Identify components of the Windows environment with the correct terminology	54	1.32
Manipulate windows with minimize, restore, and maximize	65	1.59
Differentiate Operating System Software and Application Software	53	1.29
Run more than one program simultaneously and navigate between multiple open windows	55	1.34
Print multiple copies of a document	75	1.83
Identify file types (.doc, .docx, .rtf, .pdf, .pptx)	59	1.44
Overall Mean	721	1.60
Competency Level	No Competence	

Table 3 presents the respondents' competency in Microsoft Word. The overall mean score of 1.60 indicates basic competence, suggesting that respondents are generally familiar with the fundamental functions of word processing but have limited proficiency in more advanced features. Higher competency was observed in creating, saving, and opening documents,

formatting text, and inserting tables and images. Conversely, respondents demonstrated lower competency in paragraph formatting, document navigation, mail merge, template creation, review tools, and document outlining. These findings indicate that Microsoft Word is primarily used for simple documentation rather than for preparing comprehensive administrative reports and official communications. The results imply that respondents possess sufficient skills for routine document preparation but require further training to maximize the software's capabilities for professional office work. Advanced Microsoft Word features improve the quality, consistency, and efficiency of document production, particularly within government offices where standardized reports and official correspondence are frequently prepared. Similar findings indicate that community-based ICT users generally acquire basic word-processing skills through experience but require structured training to effectively utilize advanced document management functions (Albarillo et al., 2022; Ferranco et al., 2025). Furthermore, strengthening productivity software competencies contributes significantly to organizational efficiency and supports digital governance initiatives within local government institutions (Calibo-Senit, 2026). These findings highlight the importance of implementing Microsoft Word training programs that emphasize advanced formatting techniques, templates, collaborative editing, review tools, and mail merge applications. Such competencies will improve the efficiency and professionalism of documentation processes within the barangay.

Table 3
Knowledge of Microsoft Word (N = 41)

Microsoft Word Competencies	Total	Mean
Document Creation and Management		
Create, save, and open Word documents with ease	89	2.17
Utilize the "Save As" function to save documents in various formats	81	1.98
Navigate through large documents using the Navigation Pane	64	1.56
Track document changes using Version History	63	1.54
Use the "Find and Replace" function	56	1.37
Insert and manage tables, charts, and images	76	1.85
Text Formatting and Editing		
Format text using different fonts, sizes, and colors	88	2.15
Apply paragraph formatting	48	1.17
Use bullets and numbering	48	1.17
Insert and format headers, footers, and page numbers	56	1.37
Format hyperlinks, bookmarks, and cross-references	45	1.10
Advanced Features		
Perform mail merge	54	1.32
Create and modify document templates	47	1.15
Use advanced table features such as sorting and formula integration	56	1.37
Use Word review tools (compare and combine documents)	61	1.49
Use Outline View to organize and structure documents	50	1.22
Overall Mean	982	1.60
Competency Level	No Competence	

Table 4 presents the respondents' competency in Microsoft Excel. The overall mean score of 2.27 indicates basic competence, demonstrating that respondents possess adequate knowledge of fundamental spreadsheet operations but have limited skills in more advanced analytical functions. Respondents showed greater proficiency in creating workbooks, entering and formatting data, performing basic arithmetic formulas, using AutoSum, sorting data, and preparing spreadsheets for printing. However, considerably lower competency was observed in functions such as VLOOKUP, IF statements, conditional formatting, macros, dynamic charts, lookup functions, and advanced filtering. These findings suggest that Microsoft Excel is primarily utilized for simple record-keeping and routine administrative tasks rather than for data analysis and decision support. The limited proficiency in advanced spreadsheet applications may reduce the efficiency of financial reporting, database management, inventory monitoring, and evidence-based planning within the barangay. Previous studies have similarly reported that while barangay officials often possess basic spreadsheet skills, substantial competency gaps remain in advanced applications required for efficient digital governance (Alvero et al., 2025). Likewise, strengthening spreadsheet competencies has been recognized as an important strategy for improving administrative productivity and supporting data-driven local governance (Calibo-Senit, 2026; Raagas et al., 2026). The findings emphasize the need for practical Excel training that focuses on real-world barangay applications, including budget preparation, financial reporting, inventory management, statistical summaries, and automated spreadsheet functions. Providing hands-on exercises using actual barangay records would enhance the transfer of learning and improve workplace performance.

Table 4
Knowledge of Microsoft Excel (N = 41)

Microsoft Excel Competencies	Total	Mean
Basic Spreadsheet Operations		
Create, save, and manage workbooks and worksheets	89	2.17
Enter, edit, and format cell data	62	1.51
Use basic formulas	78	1.90
Use AutoSum	60	1.46
Insert and manage rows and columns	57	1.39

Microsoft Excel Competencies	Total	Mean
Apply cell formatting	59	1.44
Use Find and Replace	49	1.20
Freeze panes	52	1.27
Sort and filter data	69	1.68
Prepare spreadsheets for printing	68	1.66
Data Analysis and Visualization		
Create and interpret basic charts	55	1.34
Use conditional formatting	68	1.66
Use VLOOKUP	59	1.44
Create dynamic charts	57	1.39
Use the IF function	50	1.22
Advanced Excel Skills		
Write and troubleshoot complex formulas	55	1.34
Use data validation	54	1.32
Use advanced filtering	46	1.12
Apply advanced charting techniques	45	1.10
Use array formulas	46	1.12
Create and manage named ranges	46	1.12
Import and export data	42	1.02
Use text functions (CONCATENATE, LEFT, RIGHT, MID)	42	1.02
Use lookup and reference functions (INDEX, MATCH, INDIRECT)	43	1.05
Create and use macros	43	1.05
Overall Mean	1,394	2.27
Competency Level		Basic Competence

Table 5 presents the respondents' competency in Microsoft PowerPoint. The overall mean score of 2.46 indicates basic competence, suggesting that respondents possess the skills necessary to create simple presentations but have limited proficiency in advanced presentation design and delivery tools. Higher competency was observed in creating presentations, applying themes, using SmartArt, and modifying slide backgrounds. In contrast, lower competency was recorded in multimedia integration, animation customization, presentation recording, remote presentation, troubleshooting, collaborative editing, and the use of presentation delivery tools. These findings indicate that respondents primarily utilize Microsoft PowerPoint for preparing basic presentation slides rather than developing interactive and engaging multimedia presentations. Effective presentation software supports communication, knowledge dissemination, community education, and stakeholder engagement, making advanced presentation skills increasingly important in local government operations. Previous studies have demonstrated that strengthening ICT competencies enhances organizational communication and improves the effectiveness of public information dissemination and community engagement (Altura et al., 2023; Budiarto et al., 2024). Moreover, integrating digital presentation technologies into local government operations contributes to more efficient governance and improved public service delivery (Antonino et al., 2025; Araullo et al., 2024). These findings suggest that future ICT training programs should emphasize multimedia integration, animation, presentation delivery techniques, online collaboration, and remote presentation platforms. Developing these competencies will enable barangay personnel to deliver more engaging presentations during meetings, training activities, public consultations, and community awareness programs, thereby supporting more effective communication and digital governance.

Table 5
Knowledge of Microsoft PowerPoint (N = 41)

Microsoft PowerPoint Competencies	Total	Mean
Slide Creation and Design		
Create, save, and manage PowerPoint presentations	89	2.17
Use slide layouts for consistent formatting	81	1.98
Apply and modify design themes	82	2.00
Insert and format text boxes, images, and shapes	64	1.56
Use Slide Master View	65	1.59
Manage slide order using Slide Sorter View	56	1.37
Create custom slide layouts	74	1.80
Use align and distribute tools	54	1.32
Use SmartArt effectively	77	1.88
Apply background styles, colors, and gradients	94	2.29
Multimedia and Animation		
Insert and format videos and audio	61	1.49
Apply animations	48	1.17
Customize animation effects	49	1.20
Use slide transitions	76	1.85
Embed and link multimedia files	47	1.15
Presentation Delivery		
Create and manage speaker notes	54	1.32

Microsoft PowerPoint Competencies	Total	Mean
Use Presenter View	73	1.78
Rehearse slide timings	44	1.07
Use slideshow tools (laser pointer and pen)	43	1.05
Record and playback presentations	62	1.51
Export presentations to PDF or video	44	1.07
Manage question-and-answer sessions	42	1.02
Conduct presentations remotely	42	1.02
Use real-time collaboration tools	45	1.10
Troubleshoot presentation issues	44	1.07
Overall Mean	1,510	2.46
Competency Level	Basic Competence	

Conclusion and Recommendations

This study assessed the Information and Communication Technology (ICT) literacy of the Barangay Camingawan workforce by examining their competencies in basic computer concepts, Microsoft Word, Microsoft Excel, and Microsoft PowerPoint, as well as their access to digital resources and ICT training opportunities. The findings revealed that while the respondents recognize the importance of ICT in carrying out their daily administrative responsibilities, their overall level of digital competency remains limited. The respondents demonstrated no competence in basic computer concepts and only basic competence in Microsoft Office applications, indicating that their existing ICT skills are insufficient to meet the increasing digital demands of local government operations. Moreover, limited access to computers, inadequate internet connectivity, and the lack of formal ICT training further constrained their ability to effectively utilize digital technologies in the workplace. The study contributes localized evidence on the ICT literacy of barangay personnel and highlights the need for sustained digital capacity-building initiatives at the grassroots level. The findings suggest that improving ICT competence requires not only greater access to digital infrastructure but also continuous, context-specific training that develops both foundational and advanced digital skills. Strengthening these competencies will enhance administrative efficiency, support digital governance initiatives, and improve the quality of public service delivery within Barangay Camingawan.

Based on the findings of the study, it is recommended that Barangay Camingawan, in partnership with Central Philippines State University and other relevant government and educational institutions, implement a structured ICT capability-building program that progresses from basic computer literacy to intermediate and advanced applications of Microsoft Word, Microsoft Excel, and Microsoft PowerPoint. The training program should incorporate practical, hands-on activities using actual barangay documents, reports, financial records, and presentation materials to ensure that participants can directly apply the acquired competencies to their daily administrative responsibilities. The barangay should also strengthen its digital infrastructure by providing adequate computer units, reliable internet connectivity, and updated productivity software to support digital operations. Continuous ICT competency assessments and periodic refresher training should be conducted to monitor learning outcomes and ensure that personnel remain responsive to technological advancements. Furthermore, technical support mechanisms and mentoring programs should be established to encourage the sustained application of ICT skills in workplace settings. Future researchers are encouraged to replicate the study in other barangays or local government units using larger and more diverse samples to improve the generalizability of the findings. Subsequent studies may also evaluate the effectiveness of ICT training interventions through experimental or longitudinal research designs and investigate additional factors influencing ICT competence, such as organizational support, technology acceptance, digital readiness, and leadership practices. Such investigations would provide deeper insights into strategies that promote sustainable digital transformation and strengthen ICT capacity among local government personnel.

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