Teachers' Ict Utilization: Basis For a Capability Building Plan
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TEACHERS' ICT UTILIZATION: BASIS FOR A CAPABILITY BUILDING PLAN

Jay Patrick V. Dela Torre and Yasmin Pascual-Dormido
STI West Negros University/patrick.delatorre001@deped.gov.phypascual77@gmail.com
https://orcid.org/0009-0001-1638-0277/https://orcid.org/0009-0000-1374-6600

Abstract

This study examined the extent of teachers' ICT utilization in far-flung public schools in a component city in Central Philippines. Anchored on Utilization Theory and the Technology Acceptance Model (TAM), the study investigated how teachers utilize the ICT system across four key domains: ICT service delivery, program effectiveness, teacher support, and digitization of services. Using a quantitative descriptive research design, the study gathered data from the total population of 138 public school teachers from three geographically isolated schools through total population sampling. Statistical analyses were employed to describe teachers' demographic profiles and determine the extent of ICT utilization when grouped according to age, sex, length of service, and highest educational attainment. The findings revealed that teachers generally reported a high level of ICT utilization across the four domains. Digitization of services and program effectiveness obtained the highest utilization ratings, indicating that the system significantly improved administrative efficiency, digital record management, and ICT-related processes in schools. ICT service delivery and teacher support also received favorable ratings, demonstrating that the ICT system contributed to faster processing of ICT concerns and improved access to technical assistance. When grouped according to demographic variables, slight variations in utilization levels were observed; however, statistical tests indicated that there were no significant differences in ICT utilization when teachers were grouped according to age, sex, length of service, and highest educational attainment. The results suggest that the ICT systems are widely utilized and perceived as beneficial across diverse teacher demographics in far-flung public schools, highlighting its role in supporting digital transformation in geographically isolated educational settings. Nevertheless, the findings underscore the need for continuous system enhancement, expanded digital services, and strengthened technical support to further improve usability and accessibility. Based on the results, a capability-building plan was developed to strengthen teachers' digital competencies, improve ICT service delivery, and promote effective ICT utilization as a sustainable digital support system in public schools. The study concludes that strengthening ICT-based service systems contributes to improving administrative efficiency, supporting teachers' digital needs, and promoting equitable access to ICT services in remote educational contexts.

Keywords: *ICT utilization, teachers, program effectiveness, geographical, age, sex, length of service, and highest educational attainment.*

Introduction

The integration of digital technology has transformed global pedagogy by enabling accessible and personalized learning (Zou et al., 2025). The widespread use of ICT has compelled schools to enhance efficiency and productivity (Saif et al., 2022). However, despite its benefits, ICT adoption may also widen inequalities by marginalizing individuals with limited access or digital skills (Latupeirissa et al., 2025). Sociocultural and economic factors further influence how institutions, particularly in Asia, adopt and sustain ICT innovations (Saif et al., 2022; Apriyantopo & Aprianingsih, 2022). Sustained digital transformation requires localized capacity-building, strong governance, innovation, and human resource development rather than short-term external support (Zhang, 2025; Shin & Kang, 2025). In the Philippines, ICT integration in education is guided by policies such as the Ease of Doing Business and Efficient Government Service Delivery Act of 2018 (RA 11032) and the Data Privacy Act of 2012 (RA 10173), which promote efficient and secure digital public service delivery. The Department of Information and Communications Technology (DICT, 2022) supports these initiatives through programs that strengthen digital transformation in education. However, implementation challenges persist, including weak internet connectivity, limited resources, and time constraints, particularly in remote schools (Chin et al., 2022). Although ICT adoption is widespread, gaps remain between initial implementation and sustained utilization due to teachers' varying competencies and readiness in integrating technology into instruction (Zou et al., 2025). Perceived usefulness and ease of use strongly influence technology acceptance among users (Ching &

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Jamaludin, 2025), while poorly implemented digital systems may unintentionally deepen inequality (Latupeirissa et al., 2025). In alignment with Sustainable Development Goal 4, equitable quality education requires strong digital systems, teacher competence, and institutional support. However, the Philippines continues to face challenges in data systems, infrastructure, and capacity-building (Albert et al., 2023). While ICT initiatives can enhance instructional and administrative efficiency, ineffective implementation may also increase teachers' workload and difficulty (Ladines, 2023; Gatcho et al., 2024). Given these challenges, the researcher, an Information Technology Officer, seeks to assess the extent of teachers' ICT utilization, identify implementation gaps, and develop a capability-building plan aimed at strengthening digital service delivery and ensuring secure, efficient, and sustainable data management in schools.

Statement of the Objectives

This study aimed to determine the extent of teachers' ICT utilization in far-flung public schools in a component city in Central Philippines as basis for a capability-building plan. Specifically, it sought to answer the following questions: 1. What is the profile of the respondents in terms of: a. Age, b. Sex, c. Length of Service, d. Highest Educational Attainment? 2. What is the extent of teachers' ICT utilization in terms of: a. Service Delivery, b. Program Effectiveness, c. Teacher Support, d. Digitization of Services? 3. What is the extent of teachers' ICT utilization when grouped according to the respondents' profile variables? 4. Is there a significant difference in the extent of teachers' ICT utilization when grouped and compared according to age, sex, length of service, and highest educational attainment? 5. Based on the findings of the study, what capability-building plan may be proposed?

Review of Related Literature

Conceptual Literature

Foreign

Extent of Teachers' ICT Utilization. The use of ICT in schools has changed how teachers teach and how students learn. Because of this, teachers now need to learn digital skills that are useful for teaching in the 21st century. Revuelta-Domínguez et al. (2022) contend that educators' digital pedagogical competencies have significantly improved, especially in lesson planning, content creation, and technology-facilitated instruction. Basilotta-Gómez-Pablos et al. (2022) likewise discovered that structured ICT training programs improve teachers' competencies in communication, pedagogy, and assessment design. Teachers' skills are important, but the workplace also affects how they use ICT. Gil-Flores et al. (2024) stressed the importance of organizational support in educational institutions, noting that teacher training, collaborative practices, and a conducive school environment facilitate the integration of ICT. Annemann et al. (2025) contend that educators involved in digitalization training exhibit more positive attitudes towards the use of ICT, improve their pedagogical methods, and use ICT more regularly. Zakir et al. (2025) also discovered that digital literacy and self-improvement significantly enhance students' confidence and performance, indicating that ICT services directly enhance learning outcomes. Research based on frameworks also helps schools make better use of ICT. Risquez et al. (2023) contend that the DigCompEdu system enhanced educators' online assessment and lesson planning. Momdjian et al. (2024) contend that in-service teachers typically demonstrate greater digital competencies compared to preservice teachers, highlighting the imperative for ongoing education and practical experience. For ICT to work well, it needs reliable infrastructure and technical support. According to research (Msambwa et al., 2024; Caratiquit & Javier, 2025), ICT integration will not succeed if the infrastructure is unreliable and technical support is not proactive. The significance of effective service delivery is highlighted by the fact that prompt ICT services enable continuous teaching and learning (Haleem et al., 2022; Timotheou et al., 2022). To keep ICT systems running well, organizations need good system design, infrastructure, and clear rules (Ibrahimi et al., 2024). When it comes to using ICT systems, teacher support systems are just as important. According to research, teachers would rather get technical help right away than read manuals or teaching guides (Roselló et al., 2025). Quick troubleshooting helps lessons go smoothly, reduces interruptions, and makes teachers feel more confident (Cheng & Parker, 2023; Hussain et al., 2025). Continuous professional development also helps people improve their ICT skills and use digital platforms over the long term (Annemann et al., 2025). Digital transformation is driven by ICT systems that enable faster decision-making and streamlined processes. Automated systems can make work more productive and reduce administrative tasks, but they only work

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well when the infrastructure is up to date, and staff are properly trained (Liu et al., 2025; Kayanja et al., 2025). Moreover, research indicates that digital learning tools enhance student engagement and academic performance (Vidal-Esteve & Martín-Gómez, 2023). Research indicates that competencies and assistance are more significant than factors such as age, gender, and ICT proficiency, which are frequently examined in studies. Older teachers prefer dependable, well-structured ICT systems (Negrín-Medina et al., 2022; Mancilla-Díaz et al., 2023), whereas younger teachers tend to be more comfortable with technology (Fahmiyah et al., 2023; Zhang et al., 2023). Nonetheless, studies indicate that resources, support, and training have a greater influence on ICT usage than demographic factors (Sergeeva et al., 2024; Moreira-Choez et al., 2024; Tomczyk, 2024).

Local

Extent of Teachers' ICT Utilization. To improve service delivery, boost productivity, and reduce administrative work, the Philippine school system is undergoing a major digital transformation. Ilyas (2025) argues that digitalization is needed to bring school administration up to date and address longstanding problems. Manual systems are slow and prone to error (Nagrama et al., 2024), so we need better digital solutions to help us get more done. National policies also help this change by encouraging better public service and effectiveness. Duruin and Siddayao (2024) said that for digital improvements in schools to work better and last longer, they need to meet national standards. ICT programs like SAFER help schools use ICT more effectively, deliver services more efficiently, and maintain records systematically (Bacud & Siddayao, 2024). Digital archiving systems are essential for preserving documents and data. Roda and Antonio (2025) stated that systematic archiving is essential in disaster-prone areas, while Bete and Collera (2025) discovered that digital archives facilitate the recording, accessing, and retrieval of data. These methods are necessary to keep documents safe while they are being archived by people (Servancia & Escarlos, 2023). Digital technology also makes educational activities more accurate, reliable, and faster. Research indicates that digital solutions are more effective than manual methods for record management and administrative support (Nagrama et al., 2024). However, for these systems to work well, the school needs to be highly dedicated, well-run, and closely monitored (Duruin & Siddayao, 2024). If this does not happen, digital systems might not achieve their goals (Bacud & Siddayao, 2024). By using e-request systems, schools can make their services better by making them easier to use and more efficient. Roda and Antonio (2025) found that online platforms improve service quality and speed up processing times. Automated notifications reduce administrative work and improve communication (Bete & Collera, 2025). Even though there are benefits, it is hard to use ICT because there are not enough resources and the internet is unreliable, especially in poor or rural areas (Servancia & Escarlos, 2025). Local research also emphasizes the importance of being prepared and knowing how to teach. Teachers' competence with ICT systems is profoundly affected by their digital skills (Guillén-Gámez et al., 2023). Nonetheless, a digital skills deficiency persists, particularly in advanced ICT use, data management, and research (Eliver et al., 2023; Servancia & Escarlos, 2025). This shows how important it is to have targeted training programs and to keep learning and growing in your career (Viernes, 2025). Teachers' opinions on ICT are strongly influenced by institutional support, including infrastructure, training, and technical support (Caratiquit & Javier, 2025). For schools to successfully undergo digital transformation, they must possess strong institutional frameworks, adequate infrastructure, and comprehensive training programs (Baruela et al., 2025).

Research Literature

Foreign

Extent of Teachers' ICT Utilization. Risquez et al. (2023) assert that e-services for educators constitute a dependable, evidence-based instrument capable of informing policy and tracking the advancement of teachers' digital competence via its six-stage progression model, underscoring its significant relevance to institutional digitization efforts. In a comparable study, Zakir et al. (2025) identified that digital competence, digital informal learning, and digital self-efficacy significantly influence the relationship between basic digital literacy and academic performance, with digital self-efficacy being the most prominent mediating factor. Zou et al. (2025) also stressed the importance of ongoing professional development to overcome technical and socio-economic obstacles in digital learning environments. They highlighted the critical role of teacher competence in achieving sustainable ICT integration. Lund and Aagaard (2022) noted an increasing academic emphasis on technology adoption initiatives and educators' willingness to adapt conventional methodologies to enhance educational quality in the digital age. In-

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service teachers are significantly more digitally proficient than preservice teachers, achieving an average score of 72.5% across all DigCompEdu categories. This highlights the pressing necessity for enhanced practical training in digital competencies within preservice curricula (Momdjian et al., 2024). Additionally, Revuelta-Domínguez et al. (2022) identified a fragmented research base on digital teaching competence, underscoring the need for more context-specific professional development due to inconsistent conceptual models, excessive reliance on self-reported instruments, and generally low-to-moderate teacher selfassessments. Basilotta-Gómez-Pablos et al. (2022) assert that educators in higher education frequently exhibit low to moderate proficiency, especially in digital assessment tasks, and emphasize the lack of established measurement instruments in this domain. Gil-Flores et al. (2024) state that both initial and ongoing training remain very important for using ICT. This shows how important it is to keep building skills. Gil-Flores et al. (2024) found that supporting initiatives such as teacher collaboration and openness to new ideas has a significant effect on how well ICT is used. This means the institution's culture is important for successful technological integration. Professional development focused on digitalization encourages teachers to use technology in the classroom, emphasizes teaching ICT skills, and helps them develop a positive attitude toward ICT. However, this varies across countries (Annemann et al., 2025). Teachers' ongoing demands for practical, contextually relevant ICT training underscore the necessity for evidence-based professional development approaches (Revuelta-Domínguez et al., 2022). BasilottaGómez-Pablos et al. (2022) corroborated this by showing that selfperception-based competence assessments frequently misrepresent actual capability, underscoring the need for more objective evaluation methods to inform institutional ICT strategies.

In conclusion, the most effective method to enhance ICT proficiency appears to be through comprehensive training programs bolstered by institutional preparedness. Zou et al. (2025) argue that ongoing professional development helps overcome socio-economic and technological barriers, making it easier for teachers to engage in creative digital learning. A study by Annemann et al. (2025) found that participation in professional development related to digitalization is a strong indicator that ICT use will improve, especially in countries where governments spend heavily on digital projects. Lund and Aagaard (2022) assert that stakeholders' use of digital technology increases the likelihood of adopting research-informed strategies and modifying pedagogical approaches. Zakir et al. (2025) emphasized the significance of teacher selfefficacy by identifying confidence-building as an essential strategy for ICT capacity development and by illustrating its role as a vital mediator linking basic literacy to favorable performance outcomes.

Local

Extent of Teachers' ICT Utilization. A localized School Records Management System (SRMS) attained an "extremely high degree of compliance" with ISO 25010 Software Quality Standards, demonstrating the technical superiority of SRMS over manual operations, as reported by Duruin and Siddayao (2024). Duruin and Siddayao's (2024) review states that the system also addressed problems with limited physical storage space and delays in document delivery. They also confirmed that the system was ready for use in institutions, as it achieved the highest scores for functional appropriateness and security. Mella and Peña (2019) say that Project GEARS helped advance the broader movement toward systematic archiving by cutting the time required to store and retrieve documents by about 50% and preventing data loss from disasters by using cloud-based storage. Based on their qualitative findings, cloud archiving bolstered the institutional memory component of the SAFER program by rendering files "accessible, organized, and secure" for the first time in the school's history (Mella &
Peña, 2019). Studies on Online Document Request Systems (ODRS) show that digitization significantly improves service delivery. Roda and Antonio (2025) used ANOVA to find that web-based systems with SMS notifications speed up credential processing, with the difference being statistically significant. They also said that mobile alerts reduced administrative work by eliminating the need for in-person follow-ups, which shows that automated status updates work (Roda & Antonio, 2025). Bacud and Siddayao (2024) corroborated these findings by reporting that their ODRS implementation achieved a high rating for accessibility and security during user acceptance testing, thereby demonstrating the reliability of automated request interfaces. Bete and Collera (2025) noted that the Learner Information System (LIS) often experiences connectivity issues and technology challenges in remote areas, which users found problematic. Their statistical analysis revealed significant disparities in teachers' perspectives on data privacy, leading them to conclude that systems without offline functionality increase teachers' workload in geographically isolated contexts (Bete & Collera, 2025). Eliver et al. (2023) found that teachers rated their research and data management skills as "moderate," especially in handling time and cost issues. This indicates that

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deficiencies in digital proficiency persist. Servancia and Escarlos (2025) showed a strong positive link between teachers' digital competence and their ability to do action research. They stressed that knowing how to use basic tools does not mean knowing how to use analytical tools or specialized software.
Their research indicates that the current professional development programs are insufficient to cultivate a workforce capable of system optimization and digital literacy (Servancia & Escarlos, 2025). Viernes (2025) identified intermediate self-rated competency across research fields to further illustrate the necessity of targeted technical capacity-building, with "Instrument Development" deemed the most critical deficiency. His cross-sectional study corroborated this, showing that without targeted intervention, educators remain incapable of designing and managing reliable data-collection instruments (Viernes, 2025). When looked at as a whole, these real-world results show that digital systems make administration more reliable, efficient, and accessible. However, their effectiveness depends on the user's skill level, the readiness of the infrastructure, and targeted professional development. Research by Duruin and Siddayao (2024) demonstrates the technical feasibility of SRMS for enhancing school operations, while studies by Mella and Peña (2019) and Roda and Antonio (2025) document quantifiable improvements in archiving and service delivery. However, research by Eliver et al. and Bete and Collera (2025) shows that technical progress has different effects in areas with low connectivity. Viernes (2023), Servancia and Escarlos (2025), and Servancia and Escarlos (2025) all show that there are still gaps in digital skills. All of these studies show that for digital transformation to work, you need both infrastructure support and programs that help people build their skills.

Methodology

Research Design

The study would employ a descriptive research design to determine the extent of teachers' ICT utilization. This design utilizes statistical methods to address research questions and hypotheses grounded in theory. It primarily encompasses the processes of collecting, analyzing, interpreting, and presenting the study's data (Creswell & Creswell, 2019). It was appropriate for the study because it sought to determine existing conditions, relationships, prevailing opinions and beliefs, observable processes and effects, and emerging trends. As a scientific approach, the descriptive design focuses on observing and documenting the subject's characteristics and behavior without manipulating or altering them.

Respondents

From a total teacher population of 138 in the three (3) identified far-flung public schools in Central Philippines, all basic education teachers assigned to these schools served as the study respondents. The distribution of teachers per school is: eighty-two (82) in School A, thirty-two (32) in School B, and twenty-four (24) in School C. These teachers represent a diverse mix of males and females, varying in age, years in service, and educational attainment, providing a comprehensive profile necessary for examining the extent of teachers' ICT utilization. The respondents in the study included all teachers who met the inclusion criteria, specifically those officially deployed in the three far-flung schools during the study. Total population sampling was employed to ensure full representation of the entire teacher population in the locale. Indrayadi (2020) defines total population sampling as a technique in which all individuals who meet the study's criteria are included as respondents, ensuring that the researcher gathers complete and comprehensive data from the entire target group.

Instrument

To determine the extent of ICT service utilization among teachers, the study collected data using a researcher-developed survey questionnaire that underwent expert validation and reliability testing. The questionnaire was composed of two parts: Part I covered the respondents' profile, including their age, sex, years in service, and educational attainment. Part II constituted the main questionnaire, designed to measure teachers' level of utilization of ICT services. A total of 40 items will be used to ensure comprehensive measurement of ICT service utilization. The teacher respondents rated the extent of utilization using a 5-point Likert scale, where 5 represents a "Very High Level," 4 a "High Level," 3 a "Moderate Level," 2 a "Low Level," and 1 a "Very Low Level."

Procedure for Data Collection

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After establishing the validity and reliability of the research instrument, the researcher wrote letters to the principals of the three selected public schools requesting permission to conduct the study. Upon approval, the researcher met with the teacher-respondents, explained the purpose of the study, and provided instructions for completing the questionnaire accurately and honestly. The respondents were assured that all information provided would be kept confidential. The researcher guided the respondents in completing the survey questionnaire and personally collected the instruments afterward. The gathered data were then organized, tabulated, and prepared for further statistical analysis.

Data Analysis and Statistical Treatment

To analyze and interpret the results, the following statistical tools were used in accordance with the study's specific objectives. Objective No. 1 used Frequency count and Percentage distribution to determine the profile of the respondents in terms of age, sex, years in service, and highest educational attainment. Objective No. 2 used the Mean to determine the extent of teachers' ICT Utilization when profile variables group respondents; verbal interpretations of mean scores will be used to describe levels. Mishra et al. (2019) explain that mean and standard deviation are commonly used as descriptive (parametric) statistics to summarize data distributions when data are roughly normally distributed. Objective No. 3 used the Mean to determine the extent of teachers' ICT Utilization when respondents were grouped and compared by age, sex, years in service, and educational attainment. Objective No. 4 utilized the Mann–Whitney U test to determine whether there is a significant difference in the extent of teachers' ICT Utilization when respondents are grouped and compared according to selected profile variables.

Results and Discussions

Profile of the Respondents in Terms of Age, Sex, Length of Service, and Highest Educational Attainment

Table 2 Profile *of the Respondents*

Variable	Category	Frequency	Percentage (%)
Age	Younger (Below 38 years old)	65	47.1
	Older (38 years old and above)	73	52.9
	Total	138	100
Sex	Male	51	37.0
	Female	87	63.0
	Total	138	100
Length of service	Shorter (Below 8 years)	67	48.6
	Longer (8 years and above)	71	51.4
	Total	138	100
Highest Educational Attainment	Lower (College graduate)	81	58.7
	Higher (post-graduate)	57	41.3
	Total	138	100

Table 2 shows that the highest percentages are observed among older teachers (52.9%), female respondents (63.0%), those with longer service (51.4%), and college graduates (58.7%), while the lowest are younger teachers (47.1%), male respondents (37.0%), those with shorter service (48.6%), and postgraduate degree holders (41.3%). The computed mean percentage across each paired category is 50.0%, indicating a generally balanced distribution of respondents across demographic groups. These findings are supported by studies indicating that the teaching workforce is commonly female-dominated and composed largely of mid- to late-career professionals, particularly in public basic education systems, as noted by Bernhard et al. (2024), who highlighted gender imbalance in teaching due to socio-cultural factors. Similarly, Okose (2024) and Yang et al. (2025) confirmed that longer teaching experience is associated with greater pedagogical competence and stability in service. However, contrasting literature suggests that higher educational attainment does not always correspond to higher instructional effectiveness unless reinforced by continuous professional development, as emphasized by Osiesi et al. (2025).

Extent of Teachers' ICT Utilization in Service Delivery, Program Effectiveness, Teacher Support, and Digitization of Services

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Table 3. *Extent of Teachers' ICT Utilization in Service Delivery*

Service Delivery Items	Mean	Interpretation
As a teacher, I am…		
1. accessing ICT services in a timely manner.	4.50	Very great
2. receiving ICT support whenever it is needed for my teaching tasks	4.44	Great
3. having technical concerns addressed promptly through ICT services	4.34	Great
4. ensuring ICT tools provided support effective classroom instruction	4.46	Great
5. experiencing reliable and consistent ICT service delivery	4.32	Great
6. minimizing delays in resolving ICT-related issues	4.32	Great
7. following clear and easy procedures when requesting ICT assistance	4.38	Great
8. benefiting from ICT services that meet my expectations in quality	4.34	Great
Overall Mean	4.39	Great

Table 3 presents the extent of teachers' ICT Utilization in Service Delivery. The overall mean of 4.39, interpreted as a "Great," indicates that teachers generally demonstrate a high level of ICT utilization and are supportive in facilitating ICT-related services. The items "experiencing reliable and consistent ICT service delivery" and "minimizing delays in resolving ICT-related issues" received the lowest mean ratings of 4.32, indicating "Great." While the majority of responses were "Great" and "Very Great," the relatively lower mean for service reliability and issue resolution suggests minor opportunities to enhance consistency and response mechanisms. Research emphasizes that dependable infrastructure and responsive technical support are essential for effective ICT integration (Msambwa et al., 2024; Caratiquit & Javier, 2025). The highest rating for timely access highlights the importance of rapid service delivery in sustaining uninterrupted instruction (Haleem et al., 2022; Timotheou et al., 2022).

Table 4. *Extent of Teachers' ICT Utilization in Program Effectiveness*

Program Effectiveness Items	Mean	Interpretation
As a teacher, I am…		
1. enhancing my ability to integrate ICT into teaching	4.57	Very great
2. improving my teaching efficiency and productivity through ICT support	4.59	Very great
3. addressing my ICT-related needs effectively	4.41	Great
4. supporting technology-enabled teaching and learning activities	4.46	Great
5. participating in training activities that are relevant to my work	4.46	Great
6. contributing positively to students' learning experiences through ICT	4.44	Great
7. achieving the ICT-related goals of the ICT programs	4.42	Great
8. producing positive outcomes in school ICT operations	4.41	Great
Overall Mean	4.47	Great

Table 4 presents the extent of teachers' ICT Utilization in terms of program effectiveness. The overall mean of 4.47, interpreted as a "Great," indicates that teachers perceive the program as highly effective in enhancing ICT competencies and teaching performance. The lowest mean ratings were recorded for "addressing my ICTrelated needs effectively" and "producing positive outcomes in school ICT operations," both at 4.41, interpreted as "Great." Since the majority of responses were "Great" and "Very Great," the findings confirm strong program effectiveness. The slightly lower ratings for operational outcomes suggest the need to strengthen infrastructure and systemic support further, as sustained ICT effectiveness depends on institutional readiness (Ibrahimi et al., 2024). The highest ratings reflect the strong impact of structured ICT support and professional development in enhancing instructional productivity and digital competence (Marquez-Baldó et al., 2025; Amemasor et al., 2025).

Table 5. *Extent of Teachers' ICT Utilization in Teacher Support*

Teacher Support Items	Mean	Interpretation
As a teacher, I am…		
1. receiving timely technical help when I encounter ICT problems	4.45	Great
2. receiving sufficient guidance in using ICT tools	4.34	Great

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3. having access to hands-on training that supports my teaching tasks	4.30	Great
4. participating in refresher training for new or updated ICT features	4.28	Great
5. accessing clear step-by-step guides or tutorials for using ICT systems	4.24	Great
6. receiving support from knowledgeable staff in resolving ICT concerns	4.39	Great
7. continuously developing ICT skills through ICT-supported activities	4.38	Great
8. having supported through helpdesks, manuals, or mentors when using ICT systems	4.36	Great
Overall Mean	4.34	Great

Table 5 presents the extent of teachers' ICT Utilization in terms of ICT support services. The overall mean of 4.34, interpreted as a "Great," indicates that teachers perceive the ICT support system as highly responsive and reliable. The lowest mean rating was for "accessing clear step-by-step guides or tutorials for using ICT systems," at 4.24, rated "Great." While the majority of responses were "Great," the slightly lower rating for tutorials suggests that teachers may prefer interactive and immediate assistance over static guides. Research indicates that educators prioritize accessible, real-time ICT support (Roselló et al., 2025). Timely troubleshooting significantly enhances teachers' confidence and continuity in digital instruction (Cheng & Parker, 2023; Hussain et al., 2025). Strengthening mentorship, interactive workshops, and continuous professional development (Annemann et al., 2025) may further enhance the effectiveness of ICT support.

Table 6. *Extent of Teachers' ICT Utilization in Digitization of Services*

Digitization of Services Items	Mean	Interpretation
As a teacher, I am…		
1. supporting the digitization of teaching and learning materials	4.60	Very Great
2. using user-friendly digital ICT platforms	4.53	Very Great
3. reducing paper-based processes through digitized ICT services	4.41	Great
4. streamlining ICT service processes in school operations	4.38	Great
5. improving record-keeping and documentation through digital services	4.41	Great
6. contributing to faster ICT transactions and service delivery	4.45	Great
7. reducing the risk of document loss or damage through digitization	4.48	Great
8. enhancing teaching and administrative efficiency through digital services	4.42	Great
Overall Mean	4.46	Great

Table 6 presents the extent of teachers ICT Utilization in terms of support for digitization. The overall mean of 4.46, interpreted as a "Great," indicates that teachers strongly perceive the program as supportive of digital transformation efforts. The lowest mean rating was for "streamlining ICT service processes in school operations," at 4.38, which was interpreted as "Great." Although the majority of responses were "Great" and "Very Great," the slightly lower rating for administrative streamlining suggests that operational digitization may still require strengthening. Studies show that automated systems improve efficiency and decision-making but require sustained infrastructure and training (Liu et al., 2025; Kayanja et al., 2025). The highest rating for instructional digitization reflects teachers' strong appreciation for digital learning materials that enhance engagement and academic performance (Vidal-Esteve & Martín-Gómez, 2023).

Extent of Teachers' ICT Utilization in Service Delivery, Program Effectiveness, Teacher Support, and Digitization of Services when grouped according to Age, Sex, Length of Service, and Highest Educational Attainment

Table 7. *Extent of Teachers' ICT Utilization in Service Delivery when grouped according to Age*

ICT Service Delivery Items	Younger Mean	Interpretation	Older Mean	Interpretation
As a teacher, I am…				
1. accessing ICT services in a timely manner.	4.51	Very Great	4.49	Great
2. receiving ICT support whenever it is needed for my teaching tasks	4.43	Great	4.45	Great
3. having technical concerns addressed promptly through ICT services	4.31	Great	4.37	Great
4. ensuring ICT tools provided support effective classroom instruction	4.48	Great	4.45	Great
5. experiencing reliable and consistent ICT service delivery	4.32	Great	4.32	Great

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6. minimizing delays in resolving ICT-related issues	4.28	Great	4.36	Great
7. following clear and easy procedures when requesting ICT assistance	4.34	Great	4.41	Great
8. benefiting from ICT services that meet my expectations in quality	4.37	Great	4.32	Great
Overall Mean	4.38	Great	4.40	Great

Table 7 presents the extent of teachers' ICT Utilization in service delivery, grouped by age. The overall means for the younger and older groups are 4.38 and 4.40, respectively, both interpreted as "Great," indicating that teachers across age groups exhibit a high level of ICT utilization and recognize digital tools as effective. Both the younger and the older teachers rated item 1, "accessing ICT services in a timely manner," highest, with a mean score of 4.51, interpreted as "Very Great," and 4.49, interpreted as "Great," respectively. This indicates that the respondents strongly perceived the ICT tools as effective in facilitating timely access to ICT services necessary for their instructional tasks. On the other hand, the younger teachers rated item 6, "minimizing delays in resolving ICT-related issues," the lowest with a mean score of 4.28, interpreted as "Great." This implies that, although still positively perceived, younger respondents viewed the timeliness of resolving ICT concerns as less satisfactory than other aspects of ICT service delivery. Meanwhile, the older teachers rated items 5 and 8, "experiencing reliable and consistent ICT service delivery" and "benefiting from ICT services that meet my expectations in quality," the lowest, with identical mean scores of 4.32, both interpreted as "Great." These findings indicate that, while older teachers generally recognized the benefits of ICT services, perceptions of service consistency and quality expectations were slightly lower than for other indicators of ICT service delivery. Studies indicate that older educators, while often confident in using technology, tend to appreciate reliable technical support and reassurance when navigating digital tools (Romero-Carazas et al., 2025; Fahmiyah et al., 2023; Peng et al., 2024).

Table 8. *Extent of Teachers' ICT Utilization in Program Effectiveness, when grouped according to Age*

Program Effectiveness Items	Younger Mean	Interpretation	Older Mean	Interpretation
As a teacher, I am…				
1. enhancing my ability to integrate ICT into teaching	4.52	Very Great	4.60	Very Great
2. improving my teaching efficiency and productivity through ICT support	4.57	Very Great	4.60	Very Great
3. addressing my ICT-related needs effectively	4.37	Great	4.44	Great
4. supporting technology-enabled teaching and learning activities	4.43	Great	4.49	Great
5. participating in training activities that are relevant to my work	4.42	Great	4.51	Very Great
6. contributing positively to students' learning experiences through ICT	4.37	Great	4.51	Very Great
7. achieving the ICT-related goals of the ICT programs	4.37	Great	4.47	Great
8. producing positive outcomes in school ICT operations	4.40	Great	4.41	Great
Overall Mean	4.43	Great	4.51	Very Great

Table 8 presents the extent of teachers' ICT Utilization in terms of program effectiveness, grouped by age. The overall mean for the younger group is 4.43, interpreted as "Great," with the older group's overall mean being 4.5, interpreted as "Very Great," reflecting generally strong positive perceptions of the program. The younger teachers rated item 2, "improving my teaching efficiency and productivity through ICT support," the highest with a mean score of 4.57, interpreted as "Very Great." This indicates that younger respondents perceived the ICT program as highly effective in enhancing their teaching performance and productivity through the integration of ICT support. Similarly, the older teachers rated items 1 and 2, "enhancing my ability to integrate ICT into teaching" and "improving my teaching efficiency and productivity through ICT support," the highest with identical mean scores of 4.60, both interpreted as "Very Great." This suggests that older respondents strongly recognized the program's role in strengthening their capacity to integrate technology into instruction and improving their overall teaching efficiency. On the other hand, the younger teachers rated items 3, 6, and 7, "addressing my ICT-related needs effectively," "contributing positively to students' learning experiences through ICT," and "achieving the ICTrelated goals of the ICT program," the lowest with identical mean scores of 4.37, all interpreted as "Great." This implies that, although still positively perceived, these aspects of program effectiveness were relatively less emphasized by younger respondents than other indicators. Meanwhile, the older teachers rated item 8, "producing positive outcomes in school ICT operations," the lowest with a mean score of 4.41, interpreted as "Great." This finding suggests that, while older teachers generally acknowledged the effectiveness of the ICT programs, their perception of their contribution to broader school ICT operational outcomes was slightly lower than for other aspects of

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program effectiveness. Research indicates that younger teachers tend to experience fewer difficulties with technology adoption and demonstrate greater digital confidence (Fahmiyah et al., 2023; Zhang et al., 2023), which may lead them to focus more on pedagogical enhancement and student engagement. Conversely, older teachers often report a greater need for structured support and practical efficiency tools to integrate ICT (Sa'diyah & Prasetiyo, 2023; Negrín-Medina et al., 2022).

Table 9. *Extent of Teachers' ICT Utilization in Teacher Support, when grouped according to Age*

Teacher Support Items	Younger Mean	Interpretation	Older Mean	Interpretation
As a teacher, I am…				
1. receiving timely technical help when I encounter ICT problems	4.37	Great	4.52	Very Great
2. receiving sufficient guidance in using ICT tools	4.26	Great	4.41	Great
3. having access to hands-on training that supports my teaching tasks	4.26	Great	4.33	Great
4. participating in refresher training for new or updated ICT features	4.22	Great	4.33	Great
5. accessing clear step-by-step guides or tutorials for using ICT systems	4.18	Great	4.29	Great
6. receiving support from knowledgeable staff in resolving ICT concerns	4.35	Great	4.42	Great
7. continuously developing ICT skills through ICT-supported activities	4.31	Great	4.44	Great
8. having supported through helpdesks, manuals, or mentors when using ICT systems	4.34	Great	4.38	Great
Overall Mean	4.29	Great	4.39	Great

Table 9 presents the extent of teachers' ICT Utilization in terms of teacher support, grouped by age. The overall mean for the younger and older groups is 4.29 and 4.39, respectively, interpreted as both "Great," reflecting generally strong positive perceptions of the program's support mechanisms across both age groups. The younger teachers rated item 1, "receiving timely technical help when I encounter ICT problems," the highest with a mean score of 4.37, interpreted as "Great." This indicates that younger respondents particularly valued the prompt technical assistance provided through the process of addressing ICT-related concerns encountered during their teaching tasks. Similarly, the older teachers rated item 1, "receiving timely technical help when I encounter ICT problems," the highest with a mean score of 4.52, interpreted as "Very Great." This suggests that older respondents strongly recognized the importance of timely technical support as a key component of teacher support. On the other hand, the younger teachers rated item 5, "accessing clear step-by-step guides or tutorials for using ICT systems," the lowest with a mean score of 4.18, interpreted as "Great." This implies that, although still positively perceived, the availability of instructional guides and tutorials was relatively less emphasized by younger respondents than other teacher support indicators. Meanwhile, the older teachers rated item 5, "accessing clear step-by-step guides or tutorials for using ICT systems," the lowest with a mean score of 4.29, interpreted as "Great." This finding indicates that while older teachers acknowledged the usefulness of providing instructional resources, this aspect was perceived slightly lower than other areas of teacher support. Research indicates that younger teachers tend to demonstrate higher baseline digital confidence and encounter fewer barriers in technology adoption (Fahmiyah et al., 2023; Peng et al., 2024), which may explain their comparatively lower dependence on structured guides and technical troubleshooting. Conversely, studies show that older teachers often value formal professional development, timely helpdesk services, and mentoring support to strengthen digital competence and sustain ICT integration (Negrín-Medina et al., 2022; Mancilla-Díaz et al., 2023). The higher ratings on timely technical assistance and continuous skill development among older teachers imply that the utilization of the ICT programs effectively addresses their instructional support needs and reinforces their digital confidence.

Table 10 *Extent of Teachers' ICT Utilization in Digitization of Services, when grouped according to Age*

Digitization of Services Items	Younger Mean	Interpretation	Older Mean	Interpretation
As a teacher, I am…				
1. supporting the digitization of teaching and learning materials	4.57	Very Great	4.62	Very Great
2. using user-friendly digital ICT platforms	4.54	Very Great	4.52	Very Great
3. reducing paper-based processes through digitized ICT services	4.43	Great	4.40	Great
4. streamlining ICT service processes in school operations	4.35	Great	4.40	Great
5. improving record-keeping and documentation through digital services	4.35	Great	4.45	Great
6. contributing to faster ICT transactions and service delivery	4.38	Great	4.51	Very Great

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7. reducing the risk of document loss or damage through digitization	4.42	Great	4.53	Very Great
8. enhancing teaching and administrative efficiency through digital services	4.35	Great	4.48	Great
Overall Mean	4.43	Great	4.49	Very Great

Table 10 presents the extent of teachers' ICT Utilization in terms of service digitization, grouped by age. The younger group had an overall mean of 4.43, interpreted as "Great." In comparison, the older group had a higher overall mean of 4.49, interpreted as "Very Great," reflecting very strong positive perceptions of the program's contribution to digital transformation in school operations. The younger teachers rated item 1, "supporting the digitization of teaching and learning materials," highest, with a mean score of 4.57, indicating "Very Great." This indicates that younger respondents strongly recognized the contribution of ICT programs to the digitization of instructional materials, thereby supporting more efficient and accessible teaching practices. Similarly, the older teachers rated item 1, "supporting the digitization of teaching and learning materials," the highest with a mean score of 4.62, interpreted as "Very Great." This suggests that older respondents also highly valued the role of the ICT programs in facilitating digital transformation in instructional resources and classroom practices. On the other hand, the younger teachers rated items 4, 5, and 8, "streamlining ICT service processes in school operations," "improving record-keeping and documentation through digital services," and "enhancing teaching and administrative efficiency through digital services," the lowest with identical mean scores of 4.35, all interpreted as "Great." This implies that, although still positively perceived, these aspects of digitization were relatively less emphasized by younger respondents than other indicators. Meanwhile, the older teachers rated item 3, "reducing paper-based processes through digitized ICT services," the lowest with a mean score of 4.40, interpreted as "Great." This finding suggests that while older teachers acknowledged the benefits of minimizing paper-based processes, this aspect received a comparatively lower rating than other digitization-related indicators. Research affirms that digital transformation in educational institutions enhances workflow efficiency, reduces administrative burden, and strengthens data management systems (Liu et al., 2025; Kayanja et al., 2025). Moreover, studies indicate that although younger teachers often possess higher baseline digital fluency, older teachers tend to value structured digital systems that improve reliability and institutional accountability (Althubyani, 2024).

Table 11. *Extent of Teachers' ICT Utilization in Service Delivery when grouped according to Sex*

ICT Service Delivery Items	Male Mean	Interpretation	Female Mean	Interpretation
As a teacher, I am…				
1. accessing ICT services in a timely manner.	4.57	Very Great	4.46	Great
2. receiving ICT support whenever it is needed for my teaching tasks	4.41	Great	4.46	Great
3. having technical concerns addressed promptly through ICT services	4.35	Great	4.33	Great
4. ensuring ICT tools provided support effective classroom instruction	4.55	Very Great	4.41	Great
5. experiencing reliable and consistent ICT service delivery	4.25	Great	4.36	Great
6. minimizing delays in resolving ICT-related issues	4.49	Great	4.22	Great
7. following clear and easy procedures when requesting ICT assistance	4.45	Great	4.33	Great
8. benefiting from ICT services that meet my expectations in quality	4.39	Great	4.31	Great
Overall Mean	4.44	Great	4.36	Great

Table 11 presents the extent of teachers' ICT Utilization in service delivery, grouped by sex. The overall means for the male and female groups are 4.44 and 4.36, respectively, interpreted as both "Great," indicating strong acceptance and utilization of ICT services within the institution. The male teachers rated item 1, "accessing ICT services in a timely manner," the highest with a mean score of 4.57, interpreted as "Very Great." This indicates that male respondents strongly perceived the ICT programs as highly effective in providing timely access to ICT services necessary for their instructional and professional tasks. Similarly, the female teachers rated item 2, "receiving ICT support whenever it is needed for my teaching tasks," the highest with a mean score of 4.46, interpreted as "Great." This suggests that female respondents particularly valued the availability of ICT support in addressing technology-related needs in teaching and classroom management. Studies indicate that differences in digital self-efficacy may influence how male and female teachers perceive technical processes, with female educators often being more attentive to procedural efficiency and support mechanisms (Arras-Vota et al., 2023; Claud & Dalisay, 2024). Successful technology adoption in educational institutions is largely influenced by performance expectancy and facilitating conditions, which determine how efficiently systems support users' tasks (Getenet et al., 2024).

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Similarly, digital platforms that streamline administrative processes can help reduce technostress and improve teacher productivity (Nuutinen & Bordi, 2025). However, infrastructure limitations such as unstable internet connectivity and limited technical support may affect the consistency of ICT services in schools (Colegado, 2025). These findings imply that strengthening infrastructure, simplifying procedures, and providing responsive technical assistance can further enhance the effectiveness and sustainability of the ICT programs.

Table 12. *Extent of Teachers' ICT Utilization in Program Effectiveness, when grouped according to Sex*

Program Effectiveness Items	Male Mean	Interpretation	Female Mean	Interpretation
As a teacher, I am…				
1. enhancing my ability to integrate ICT into teaching	4.61	Very Great	4.54	Very Great
2. improving my teaching efficiency and productivity through ICT support	4.59	Very Great	4.59	Very Great
3. addressing my ICT-related needs effectively	4.43	Great	4.39	Great
4. supporting technology-enabled teaching and learning activities	4.51	Very Great	4.44	Great
5. participating in training activities that are relevant to my work	4.49	Great	4.45	Great
6. contributing positively to students' learning experiences through ICT	4.45	Great	4.44	Great
7. achieving the ICT-related goals of the ICT programs	4.49	Great	4.38	Great
8. producing positive outcomes in school ICT operations	4.41	Great	4.40	Great
Overall Mean	4.50	Very Great	4.45	Great

Table 12 shows that male teachers obtained the highest mean score of 4.61 in enhancing their ability to integrate ICT into teaching (Very Great), while their lowest mean score was 4.41 in producing positive outcomes in school ICT operations (Great). For female teachers, the highest mean score was 4.59 in improving teaching efficiency and productivity through ICT support (Very Great), while the lowest mean score was 4.38 in achieving the ICT-related goals of the ICT programs (Great). Overall, both groups showed high ICT program effectiveness, with a higher overall mean among males (4.50) than females (4.45). Studies indicate that differences in digital self-efficacy may influence how male and female teachers perceive technical processes, with female educators often being more attentive to procedural efficiency and support mechanisms (Arras-Vota et al., 2023; Claud & Dalisay, 2024). Successful technology adoption in educational institutions is largely influenced by performance expectancy and facilitating conditions, which determine how efficiently systems support users' tasks (Getenet et al., 2024). Similarly, digital platforms that streamline administrative processes can help reduce technostress and improve teacher productivity (Nuutinen & Bordi, 2025). However, infrastructure limitations such as unstable internet connectivity and limited technical support may affect the consistency of ICT services in schools (Colegado, 2025). These findings imply that strengthening infrastructure, simplifying procedures, and providing responsive technical assistance can further enhance the effectiveness and sustainability of the ICT programs.

Table 13. *Extent of Teachers' ICT Utilization in Teacher Support, when grouped according to Sex*

Teacher Support Items	Male Mean	Interpretation	Female Mean	Interpretation
As a teacher, I am…				
1. receiving timely technical help when I encounter ICT problems	4.53	Very Great	4.40	Great
2. receiving sufficient guidance in using ICT tools	4.43	Great	4.29	Great
3. having access to hands-on training that supports my teaching tasks	4.33	Great	4.28	Great
4. participating in refresher training for new or updated ICT features	4.43	Great	4.18	Great
5. accessing clear step-by-step guides or tutorials for using ICT systems	4.39	Great	4.15	Great
6. receiving support from knowledgeable staff in resolving ICT concerns	4.47	Great	4.34	Great
7. continuously developing ICT skills through ICT-supported activities	4.47	Great	4.32	Great

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8. having supported through helpdesks, manuals, or mentors when using ICT systems	4.61	Very Great	4.22	Great
Overall Mean	4.46	Great	4.28	Great

Table 13 shows that for male teachers, the highest mean score was 4.61 in having support through helpdesks, manuals, or mentors when using ICT systems (Very Great), while the lowest mean score was 4.33 in having access to hands-on training that supports teaching tasks (Great). For female teachers, the highest mean score was 4.40 in receiving timely technical help when encountering ICT problems (Great), while the lowest mean score was 4.15 in accessing clear step-by-step guides or tutorials for using ICT systems (Great). Overall, male teachers obtained a higher overall mean (4.46, Great) compared to female teachers (4.28, Great), indicating slightly stronger perceived ICT support among males. Research suggests that gender differences in ICT competence and utilization are often minimal when adequate institutional support and training opportunities are available (Sergeeva et al., 2024; Alastor et al., 2025). Studies further emphasize that teachers' digital competencies are more strongly influenced by professional development, access to technology, and institutional context rather than sex alone (Moreira-Choez et al., 2024; Tomczyk, 2024).

Table 14. *Extent of Teachers' ICT Utilization in Digitization of Services, when grouped according to Sex*

Digitization of Services Items	Male Mean	Interpretation	Female Mean	Interpretation
As a teacher, I am…				
1. supporting the digitization of teaching and learning materials	4.65	Very Great	4.57	Very Great
2. using user-friendly digital ICT platforms	4.61	Very Great	4.48	Great
3. reducing paper-based processes through digitized ICT services	4.41	Great	4.41	Great
4. streamlining ICT service processes in school operations	4.45	Great	4.33	Great
5. improving record-keeping and documentation through digital services	4.45	Great	4.38	Great
6. contributing to faster ICT transactions and service delivery	4.61	Very Great	4.36	Great
7. reducing the risk of document loss or damage through digitization	4.47	Great	4.48	Great
8. enhancing teaching and administrative efficiency through digital services	4.47	Great	4.39	Great
Overall Mean	4.52	Very Great	4.43	Great

Table 14 reveals that for male teachers, the highest mean score was 4.65 in supporting the digitization of teaching and learning materials (Very Great), while the lowest mean score was 4.41 in reducing paper-based processes through digitized ICT services (Great). For female teachers, the highest mean score was 4.57 in supporting the digitization of teaching and learning materials (Very Great), while the lowest mean score was 4.33 in streamlining ICT service processes in school operations (Great). Overall, male teachers obtained a higher overall mean (4.52, Very Great) compared to female teachers (4.43, Great), indicating a slightly higher extent of ICT utilization in digitization of services among male respondents. Recent studies support these findings by emphasizing the growing role of digital transformation in improving educational efficiency and sustainability. Digital systems help reduce reliance on manual and paper-based processes while improving accessibility and collaboration in educational institutions. Kayanja et al. (2025) highlight that digitization initiatives significantly enhance institutional efficiency and administrative coordination. Similarly, Timotheou et al. (2022) explain that integrating digital technologies into school systems strengthens teachers' digital competence and supports more effective instructional practices when reliable platforms and infrastructure are available. Studies examining gender and digital competence further report that differences in technology utilization between male and female teachers are generally minimal when equal access to resources and professional development opportunities is provided. Sergeeva et al. (2024) and Alastor et al. (2025) emphasize that institutional support and training play a more critical role than gender in shaping teachers' ICT integration. Moreover, Moreira-Choez et al. (2024).

Table 15. *Extent of Teachers' ICT Utilization in Service Delivery when grouped according to Length of Service*

ICT Service Delivery Items	Shorter Mean	Interpretation	Longer Mean	Interpretation
As a teacher, I am…				
1. accessing ICT services in a timely manner	4.58	Very Great	4.42	Great
2. receiving ICT support whenever it is needed for my teaching tasks	4.49	Great	4.39	Great
3. having technical concerns addressed promptly through ICT services	4.34	Great	4.34	Great

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4. ensuring ICT tools provided support effective classroom instruction	4.46	Great	4.46	Great
5. experiencing reliable and consistent ICT service delivery	4.36	Great	4.28	Great
6. minimizing delays in resolving ICT-related issues	4.31	Great	4.32	Great
7. following clear and easy procedures when requesting ICT assistance	4.43	Great	4.32	Great
8. benefiting from ICT services that meet my expectations in quality	4.42	Great	4.27	Great
Overall Mean	4.43	Great	4.35	Great

Table 15 shows that for teachers with shorter length of service, the highest mean score was 4.58 in accessing ICT services in a timely manner (Very Great), while the lowest mean score was 4.31 in minimizing delays in resolving ICT-related issues (Great). For teachers with longer length of service, the highest mean scores were 4.46 in having ICT tools that support effective classroom instruction and 4.34 in having technical concerns addressed promptly (Great), while the lowest mean score was 4.27 in benefiting from ICT services that meet expectations in quality (Great). Overall, teachers with shorter service obtained a higher overall mean (4.43, Great) compared to those with longer service (4.35, Great), indicating slightly better perceived ICT service delivery among less experienced teachers. Recent studies support these findings by emphasizing that teachers' digital competence and ICT integration are influenced by professional experience, digital literacy, and institutional support. Guillén-Gámez et al. (2023) found that teachers' digital competence significantly influences their ability to integrate ICT tools into instructional practices. Similarly, Tomczyk (2024) highlighted that developing teachers' digital competence is essential for effective technology integration, particularly among newer teachers, who often have stronger baseline digital skills from their exposure to technology during teacher education programs. Furthermore, Msambwa et al. (2024) reported that successful ICT integration in schools depends on adequate infrastructure, institutional support, and teachers' readiness to adopt digital technologies.

Table 16. *Extent of Teachers' ICT Utilization in Program Effectiveness, when grouped according to Length of Service*

Program Effectiveness Items	Shorter Mean	Interpretation	Longer Mean	Interpretation
As a teacher, I am…				
1. enhancing my ability to integrate ICT into teaching	4.57	Very Great	4.56	Very Great
2. improving my teaching efficiency and productivity through ICT support	4.61	Very Great	4.56	Very Great
3. addressing my ICT-related needs effectively	4.45	Great	4.37	Great
4. supporting technology-enabled teaching and learning activities	4.48	Great	4.45	Great
5. participating in training activities that are relevant to my work	4.51	Very Great	4.42	Great
6. contributing positively to students' learning experiences through ICT	4.39	Great	4.49	Great
7. achieving the ICT-related goals of the ICT programs	4.45	Great	4.39	Great
8. producing positive outcomes in school ICT operations	4.45	Great	4.37	Great
Overall Mean	4.49	Great	4.45	Great

Table 16 shows that for teachers with shorter length of service, the highest mean scores were 4.61 in improving teaching efficiency and productivity through ICT support and 4.57 in enhancing the ability to integrate ICT into teaching (Very Great), while the lowest mean score was 4.39 in contributing positively to students' learning experiences through ICT (Great). For teachers with longer length of service, the highest mean score was 4.56 in both enhancing ICT integration and improving teaching efficiency and productivity (Very Great), while the lowest mean scores were 4.37 in addressing ICT-related needs effectively and producing positive outcomes in school ICT operations (Great). Overall, teachers with shorter service obtained a slightly higher overall mean (4.49, Great) compared to those with longer service (4.45, Great), indicating marginal differences in perceived ICT program effectiveness based on length of service. Research indicates that new teachers with strong digital competence are better able to integrate digital technologies to enhance teaching efficiency and student engagement (Althubyani, 2024). Similarly, Loureiro et al. (2024) highlighted that successful ICT integration depends on teachers' digital literacy, experience with educational technologies, and access to relevant digital resources and training opportunities. Furthermore, Huang et al. (2024) reported that ICT-focused professional development improves teachers' instructional strategies and supports continuous professional learning through the use of digital tools and collaborative platforms. Studies also emphasize that strengthening teachers' digital competence improves

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teaching quality and student learning outcomes, particularly when supported by institutional training and infrastructure (Aydin et al., 2024).

Table 17. *Extent of Teachers' ICT Utilization in Teacher Support, when grouped according to Length of Service*

Teacher Support Items	Shorter Mean	Interpretation	Longer Mean	Interpretation
As a teacher, I am…				
1. receiving timely technical help when I encounter ICT problems	4.42	Great	4.48	Great
2. receiving sufficient guidance in using ICT tools	4.33	Great	4.35	Great
3. having access to hands-on training that supports my teaching tasks	4.36	Great	4.24	Great
4. participating in refresher training for new or updated ICT features	4.31	Great	4.24	Great
5. accessing clear step-by-step guides or tutorials for using ICT systems	4.24	Great	4.24	Great
6. receiving support from knowledgeable staff in resolving ICT concerns	4.42	Great	4.37	Great
7. continuously developing ICT skills through ICT-supported activities	4.37	Great	4.38	Great
8. having supported through helpdesks, manuals, or mentors when using ICT systems	4.40	Great	4.32	Great
Overall Mean	4.36	Great	4.33	Great

Table 17 shows that for teachers with shorter length of service, the highest mean score was 4.42 in both receiving timely technical help when encountering ICT problems and receiving support from knowledgeable staff in resolving ICT concerns (Great), while the lowest mean score was 4.24 in accessing clear step-by-step guides or tutorials for using ICT systems (Great). For teachers with longer length of service, the highest mean score was 4.48 in receiving timely technical help when encountering ICT problems (Great), while the lowest mean scores were 4.24 in having access to hands-on training, participating in refresher training, and accessing clear step-by-step guides or tutorials (Great). Overall, teachers with shorter service obtained a slightly higher overall mean (4.36, Great) compared to those with longer service (4.33, Great), indicating marginal differences in perceived ICT teacher support based on length of service. Guillén-Gámez et al. (2023) highlighted that teachers' ability to integrate digital technologies is strongly influenced by access to technical support, professional training, and institutional guidance. Similarly, Caratiquit et al. (2025) reported that school support systems and technoefficacy significantly influence teachers' attitudes toward the use of digital technologies, emphasizing the role of responsive support mechanisms such as helpdesks, mentoring, and technical assistance. Furthermore, Osorio-Vanegas et al. (2025) emphasized that continuous professional development and structured training programs are essential for strengthening teachers' digital competence and improving their ability to integrate technology effectively in teaching. Additional research also indicates that strengthening teachers' digital literacy and ICT competencies is fundamental for achieving sustainable digital transformation in educational institutions (Amilusholihah, 2024).

Table 18. *Extent of Teachers' ICT Utilization in Digitization of Services, when grouped according to Length of Service*

Digitization of Services Items	Shorter Mean	Interpretation	Longer Mean	Interpretation
As a teacher, I am…				
1. supporting the digitization of teaching and learning materials	4.61	Very Great	4.59	Very Great
2. using user-friendly digital ICT platforms	4.61	Very Great	4.45	Great
3. reducing paper-based processes through digitized ICT services	4.46	Great	4.37	Great
4. streamlining ICT service processes in school operations	4.43	Great	4.32	Great
5. improving record-keeping and documentation through digital services	4.40	Great	4.41	Great
6. contributing to faster ICT transactions and service delivery	4.45	Great	4.45	Great
7. reducing the risk of document loss or damage through digitization	4.49	Great	4.46	Great
8. enhancing teaching and administrative efficiency through digital services	4.42	Great	4.42	Great
Overall Mean	4.49	Great	4.44	Great

Table 18 shows that for teachers with shorter length of service, the highest mean scores were 4.61 in supporting the digitization of teaching and learning materials and using user-friendly digital ICT platforms (Very Great), while the lowest mean score was 4.40 in improving record-keeping and documentation through digital services (Great). For teachers with longer length of service, the highest mean score was 4.59 in supporting the digitization of teaching and learning materials (Very Great), while the lowest mean score was 4.32 in streamlining

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ICT service processes in school operations (Great). Overall, teachers with shorter service obtained a higher overall mean (4.49, Great) compared to those with longer service (4.44, Great), indicating slightly greater ICT utilization in digitization of services among less experienced teachers. Recent studies show that new teachers with stronger digital competence are better able to use digital platforms to enhance instructional delivery and administrative efficiency (Althubyani, 2024). Similarly, research indicates that digital technologies improve teaching practices by enabling access to digital resources, strengthening collaboration, and facilitating efficient information management in schools (Aydin, 2024). Systematic reviews further highlight that the successful integration of ICT in education depends on continuous professional development, institutional support, and reliable digital infrastructure that enables teachers to transition from traditional to technology-enhanced practices (Msambwa et al., 2024). Moreover, studies show that technology-enabled professional development programs significantly enhance teachers' ability to adopt digital systems and support broader digital transformation in educational institutions (Huang et al., 2024).

Table 19. *Extent of Teachers' ICT Utilization in Service Delivery when grouped according to Highest Educational Attainment*

ICT Service Delivery Items	Lower Mean	Interpretation	Higher Mean	Interpretation
As a teacher, I am…				
1. accessing ICT services in a timely manner.	4.52	Very Great	4.47	Great
2. receiving ICT support whenever it is needed for my teaching tasks	4.48	Great	4.39	Great
3. having technical concerns addressed promptly through ICT services	4.26	Great	4.46	Great
4. ensuring ICT tools provided support effective classroom instruction	4.48	Great	4.44	Great
5. experiencing reliable and consistent ICT service delivery	4.32	Great	4.32	Great
6. minimizing delays in resolving ICT-related issues	4.31	Great	4.33	Great
7. following clear and easy procedures when requesting ICT assistance	4.36	Great	4.40	Great
8. benefiting from ICT services that meet my expectations in quality	4.36	Great	4.32	Great
Overall Mean	4.39	Great	4.39	Great

Table 19 shows that for teachers with lower educational attainment, the highest mean score was 4.52 in accessing ICT services in a timely manner (Very Great), while the lowest mean score was 4.26 in having technical concerns addressed promptly through ICT services (Great). For teachers with higher educational attainment, the highest mean score was 4.47 in accessing ICT services in a timely manner (Great), while the lowest mean scores were 4.32 in experiencing reliable and consistent ICT service delivery and benefiting from ICT services that meet expectations in quality (Great). Overall, both groups obtained an equal overall mean of 4.39 (Great), indicating no difference in perceived ICT service delivery based on highest educational attainment. Recent studies support these findings by emphasizing that teachers' effective use of ICT services is influenced by digital competence, institutional support, and access to reliable technological infrastructure. Guillén-Gámez et al. (2023) reported that teachers' digital competence significantly influences their ability to integrate ICT tools into instructional practices and utilize digital platforms efficiently in school operations. Similarly, Caratiquit and Javier (2025) emphasized that institutional support systems—such as technical assistance, professional training, and responsive ICT services—play a crucial role in strengthening teachers' confidence and attitudes toward technology integration. Research also shows that digital technologies enhance educational service delivery by improving communication, expanding access to learning resources, and facilitating efficient management of instructional and administrative processes (Haleem et al., 2022).

Table 20. *Extent of Teachers' ICT Utilization in Program Effectiveness, when grouped according to Highest Educational Attainment*

Program Effectiveness Items	Lower Mean	Interpretation	Higher Mean	Interpretation
As a teacher, I am…				
1. enhancing my ability to integrate ICT into teaching	4.57	Very Great	4.56	Very Great
2. improving my teaching efficiency and productivity through ICT support	4.64	Very Great	4.51	Very Great
3. addressing my ICT-related needs effectively	4.41	Great	4.40	Great
4. supporting technology-enabled teaching and learning activities	4.48	Great	4.44	Great
5. participating in training activities that are relevant to my work	4.52	Very Great	4.39	Great
6. contributing positively to students' learning experiences through ICT	4.42	Great	4.47	Great
7. achieving the ICT-related goals of the ICT programs	4.41	Great	4.44	Great

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8. producing positive outcomes in school ICT operations	4.41	Great	4.40	Great
Overall Mean	4.48	Great	4.45	Great

Table 20 shows that for teachers with lower educational attainment, the highest mean score was 4.64 in improving teaching efficiency and productivity through ICT support (Very Great), while the lowest mean scores were 4.41 in addressing ICT-related needs effectively, achieving ICT-related goals, and producing positive outcomes in school ICT operations (Great). For teachers with higher educational attainment, the highest mean score was 4.56 in enhancing the ability to integrate ICT into teaching (Very Great), while the lowest mean scores were 4.40 in addressing ICT-related needs effectively and producing positive outcomes in school ICT operations (Great). Overall, teachers with lower educational attainment obtained a slightly higher overall mean (4.48, Great) compared to those with higher educational attainment (4.45, Great), indicating minimal differences in perceived ICT program effectiveness based on educational level. Research shows that teachers' ability to integrate digital technologies into teaching practices is significantly influenced by their digital competence, technological resources, and institutional support mechanisms (Guillén-Gámez et al., 2023). Similarly, Amilusholihah et al. (2024) highlighted that digital competence enables teachers to effectively incorporate digital tools into teaching activities, improve productivity, and enhance students' learning experiences. Studies also indicate that teachers' digital competencies play a crucial role in the successful implementation of technology-enhanced learning and overall educational quality (Sulistiani & Dewi, 2024). Furthermore, systematic reviews emphasize that continuous professional development and ICT training programs are essential in strengthening teachers' digital competencies and enabling them to adapt to rapidly evolving digital educational environments (Domínguez-González et al., 2025).

Table 21. *Extent of Teachers' ICT Utilization in Teacher Support, when grouped according to Highest Educational Attainment*

Teacher Support Items	Lower Mean	Interpretation	Higher Mean	Interpretation
As a teacher, I am…				
1. receiving timely technical help when I encounter ICT problems	4.47	Great	4.42	Great
2. receiving sufficient guidance in using ICT tools	4.36	Great	4.32	Great
3. having access to hands-on training that supports my teaching tasks	4.30	Great	4.30	Great
4. participating in refresher training for new or updated ICT features	4.26	Great	4.30	Great
5. accessing clear step-by-step guides or tutorials for using ICT systems	4.19	Great	4.32	Great
6. receiving support from knowledgeable staff in resolving ICT concerns	4.41	Great	4.37	Great
7. continuously developing ICT skills through ICT-supported activities	4.35	Great	4.42	Great
8. having supported through helpdesks, manuals, or mentors when using ICT systems	4.36	Great	4.37	Great
Overall Mean	4.34	Great	4.35	Great

Table 21 shows that for teachers with lower educational attainment, the highest mean score was 4.47 in receiving timely technical help when encountering ICT problems (Great), while the lowest mean score was 4.19 in accessing clear step-by-step guides or tutorials for using ICT systems (Great). For teachers with higher educational attainment, the highest mean score was 4.42 in continuously developing ICT skills through ICT-supported activities (Great), while the lowest mean scores were 4.30 in having access to hands-on training that supports teaching tasks and participating in refresher training for new or updated ICT features (Great). Overall, teachers with higher educational attainment obtained a slightly higher overall mean (4.35, Great) compared to those with lower educational attainment (4.34, Great), indicating an almost equal level of perceived ICT teacher support across educational groups. Research shows that teachers' professional digital competence comprises technical, pedagogical, and organizational skills that enable educators to use digital technologies in teaching and learning effectively (Loureiro et al., 2024). Similarly, studies indicate that teachers' ICT competence significantly influences their confidence and attitudes toward digital teaching, as stronger competence leads to higher techno-efficacy and more effective use of digital tools in the classroom (Caratiquit & Javier, 2025). Systematic reviews further highlight that continuous professional development and training programs are essential for helping teachers adapt to emerging technologies and evolving digital teaching practices (Domínguez-González et al., 2025). Research also emphasizes that strengthening teachers' digital competence is a crucial requirement for 21st-century education, enabling educators to create interactive learning environments and support educational digital transformation (Amilusholihah,

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2024). Moreover, studies suggest that insufficient training opportunities and limited institutional support can hinder teachers' ability to fully utilize advanced digital technologies (Karimi, 2025).

Table 22. *Extent of Teachers' ICT Utilization in Digitization of Services, when grouped according to Highest Educational Attainment*

Digitization of Services Items	Lower Mean	Interpretation	Higher Mean	Interpretation
As a teacher, I am…				
1. supporting the digitization of teaching and learning materials	4.61	Very Great	4.58	Very Great
2. using user-friendly digital ICT platforms	4.54	Very Great	4.51	Very Great
3. reducing paper-based processes through digitized ICT services	4.42	Great	4.40	Great
4. streamlining ICT service processes in school operations	4.36	Great	4.40	Great
5. improving record-keeping and documentation through digital services	4.38	Great	4.44	Great
6. contributing to faster ICT transactions and service delivery	4.46	Great	4.44	Great
7. reducing the risk of document loss or damage through digitization	4.51	Very Great	4.44	Great
8. enhancing teaching and administrative efficiency through digital services	4.40	Great	4.46	Great
Overall Mean	4.46	Great	4.46	Great

Table 22 shows that for teachers with lower educational attainment, the highest mean score was 4.61 in supporting the digitization of teaching and learning materials (Very Great), while the lowest mean score was 4.36 in streamlining ICT service processes in school operations (Great). For teachers with higher educational attainment, the highest mean score was 4.58 in supporting the digitization of teaching and learning materials (Very Great), while the lowest mean scores were 4.40 in reducing paper-based processes and streamlining ICT service processes in school operations (Great). Overall, both groups obtained an equal overall mean of 4.46 (Great), indicating no significant difference in ICT utilization in digitization of services based on highest educational attainment. Research highlighted that teachers' digital competence significantly influences their ability to integrate ICT tools and digital platforms into instructional and administrative practices (Guillén-Gámez et al., 2023). Similarly, Msambwa et al. (2024) emphasized that effective ICT integration enables teachers to use digital platforms for communication, resource management, and collaborative learning, thereby improving teaching efficiency and institutional performance. Research also indicates that teachers who develop strong digital competence are better able to adapt to technology-enabled educational environments and support digital transformation initiatives in schools (Nagel, 2025). In addition, studies highlight that digital literacy significantly influences teachers' adoption of digital learning media and the effectiveness of ICTbased educational services (Purwadi, 2024). Systematic reviews further emphasize that continuous professional development and institutional support are essential for sustaining digital transformation in education and strengthening teachers' ability to integrate emerging technologies into instructional practices (Domínguez-González et al., 2025).

Comparative Analysis in the Extent of Teachers' ICT Utilization in ICT Service Delivery, Program Effectiveness, Teacher Support, and Digitization of Services when grouped and compared according to Aforementioned Variables

Table 23. *Differences in the Extent of Teachers' ICT Utilization in Service Delivery, when grouped and compared according to variables*

ICT Service Delivery Variables	Categories	N	Mean Rank	Mann Whitney U-test	Sig. Level	p-value	Interpretation
Age	Younger	65	68.64	2316.50	0.05	0.809	Not Significant
	Older	73	70.27				
Sex	Male	51	74.04	1987.00		0.302	Not Significant
	Female	87	66.84				

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Length of Service	Shorter	67	69.29	2364.50	0.952	Not Significant
	Longer	71	69.70			
Highest Educational Attainment	Lower	81	65.46	1981.00	0.152	Not Significant
	Higher	57	75.25			

Table 23 shows that there are no significant differences in the extent of teachers' ICT utilization in service delivery when grouped according to age, sex, length of service, and highest educational attainment, as all computed p-values are greater than the 0.05 level of significance. Specifically, age (p = 0.809), sex (p = 0.302), length of service (p = 0.952), and highest educational attainment (p = 0.152) all indicate non-significant results, leading to the acceptance of the null hypothesis. This implies that teachers' ICT utilization in service delivery is relatively consistent across different demographic groups. The findings suggest that factors such as age, gender, teaching experience, and educational attainment do not significantly influence how teachers utilize ICT in delivering services, which may indicate that ICT systems and support structures are uniformly implemented across schools. Research by Guillén-Gámez et al. (2023) found that teachers' integration of ICT is primarily influenced by digital competence, institutional support, and access to technological infrastructure rather than demographic attributes such as age or gender. Similarly, Alieto et al. (2024) reported that gender differences do not significantly influence teachers' attitudes toward digital learning technologies when adequate access and training are provided, suggesting that equitable digital support systems can minimize demographic disparities in technology adoption. Furthermore, Caratiquit and Javier (2025) highlighted that school support and techno-efficacy significantly shape teachers' attitudes toward digital teaching, emphasizing that institutional ICT support systems can enhance teachers' digital competence regardless of their demographic characteristics. In addition, studies on digital transformation in education indicate that effective digital initiatives require strong institutional frameworks, training opportunities, and access to digital infrastructure to ensure consistent implementation across diverse teacher populations (Bui, 2023).

Table 24. *Differences in the Extent of Teachers' ICT Utilization in Program Effectiveness, when grouped and compared according to variables*

Program Effectiveness							
Variables	Categories	N	Mean Rank	Mann Whitney U-test	Sig. Level	p-value	Interpretation
Age	Younger	65	66.08	2150. 50	0.05	0.336	Not Significant
	Older	73	72.54				
Sex	Male	51	73.16	2032.00		0.403	Not Significant
	Female	87	67.36				
Length of Service	Shorter	67	67.52	2246.00		0.566	Not Significant
	Longer	71	71.37				
Highest Educational Attainment	Lower	81	66.32	2051.00		0.258	Not Significant
	Higher	57	74.02				

Table 24 shows that there are no significant differences in the extent of teachers' ICT utilization in program effectiveness when grouped according to age, sex, length of service, and highest educational attainment, as all p-values are greater than the 0.05 level of significance. Specifically, age (p = 0.336), sex (p = 0.403), length of service (p = 0.566), and highest educational attainment (p = 0.258) all indicate non-significant results, leading to the acceptance of the null hypothesis. This implies that teachers perceive the effectiveness of ICT programs similarly regardless of their demographic characteristics. The findings suggest that ICT programs are implemented in a uniform manner across different teacher groups, resulting in consistent perceptions of effectiveness. Overall, demographic factors such as age, sex, teaching experience, and educational attainment do not significantly influence teachers' perceived ICT program effectiveness. For instance, a study conducted among public school teachers in the

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Philippines found that teachers' techno-efficacy and school support significantly influence their attitudes toward digital teaching tools regardless of demographic factors (Caratiquit & Javier, 2025). Similarly, Sergeeva et al. (2024) reported that differences in teachers' demographic characteristics, such as gender and academic level, often do not significantly affect ICT competence beliefs, suggesting that professional training and institutional support play a more critical role in shaping teachers' perceptions of digital tools in education. Furthermore, studies on digital transformation in education indicate that teachers across demographic backgrounds tend to develop similar perceptions of technology integration when provided with adequate training and technological resources (Althubyani, 2024). In addition, global research emphasizes that digital transformation initiatives in education improve instructional practices and organizational efficiency when supported by institutional infrastructure and professional development opportunities (Haleem et al., 2022).

Table 25. *Differences in the Extent of Teachers' ICT Utilization in Teacher Support, when grouped and compared according to Variables*

Teacher Support							
Variables	Categories	N	Mean Rank	Mann Whitney U-test	Sig. Level	p-value	Interpretation
Age	Younger	65	65.91	2139.00	0.05	0.313	Not Significant
	Older	73	72.70				
Sex	Male	51	77.77	1796.50		0.059	Not Significant
	Female	87	64.65				
Length of Service	Shorter	67	68.07	2282.50		0.679	Not Significant
	Longer	71	70.85				
Highest Educational Attainment	Lower	81	65.37	1974.00		0.143	Not Significant
	Higher	57	75.37				

Table 25 shows that there are no significant differences in the extent of teachers' ICT utilization in teacher support when grouped according to age, sex, length of service, and highest educational attainment, as all p-values are greater than the 0.05 level of significance. Specifically, age (p = 0.313), sex (p = 0.059), length of service (p = 0.679), and highest educational attainment (p = 0.143) all indicate non-significant results, leading to the acceptance of the null hypothesis. This implies that teachers experience and perceive ICT-related support in a relatively similar manner regardless of their demographic characteristics. The findings suggest that ICT support systems such as technical assistance, training, and helpdesk services are consistently provided across all teacher groups, contributing to uniform perceptions of support. Overall, demographic variables do not significantly influence the extent of ICT teacher support. Research suggests that institutional support, training opportunities, and technological infrastructure are more influential in shaping teachers' attitudes toward ICT integration than demographic factors. For instance, Caratiquit and Javier (2025) found that teachers' ICT competence and techno-efficacy significantly influence their attitudes toward digital teaching tools, particularly when adequate school support is available. Similarly, Galindo-Domínguez et al. (2024) emphasized that teachers' digital competence is strongly associated with positive attitudes toward technology integration regardless of personal variables such as gender or age. A broader review of ICT integration in education also highlights that digital technologies enhance teaching practices, institutional management, and student engagement when supported by effective training and technical support systems (Timotheou et al., 2023). Furthermore, research on digital transformation awareness among teachers indicates that professional development programs and institutional initiatives help create uniform perceptions of digital innovation among educators, minimizing demographic disparities in technology adoption (Mazman Akar et al., 2025).

Table 26. *Differences in the Extent of Teachers' ICT Utilization in Digitization of Services, when grouped and compared according to Variables*

Digitization of Services							
Variables	Categories	N	Mean Rank	Mann Whitney	Sig. Level	p-value	Interpretation

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				U-test			
Age	Younger	65	67.01	2210.50	0.05	0.482	Not Significant
	Older	73	71.72				
Sex	Male	51	75.45	1915.00		0.174	Not Significant
	Female	87	66.01				
Length of Service	Shorter	67	69.44	2374.50		0.986	Not Significant
	Longer	71	69.56				
Highest Educational Attainment	Lower	81	66.59	2073.00		0.301	Not Significant
	Higher	57	73.63				

Table 26 shows that there are no significant differences in the extent of teachers' ICT utilization in digitization of services when grouped according to age, sex, length of service, and highest educational attainment, as all p-values are greater than the 0.05 level of significance. Specifically, age (p = 0.482), sex (p = 0.174), length of service (p = 0.986), and highest educational attainment (p = 0.301) all yielded non-significant results, leading to the acceptance of the null hypothesis. This implies that teachers' engagement in ICT-based digitization of services such as digital platforms use, paperless processes, and electronic documentation is relatively consistent across different demographic groups. The findings suggest that digitization initiatives are uniformly implemented and experienced by teachers regardless of their personal and professional characteristics, resulting in comparable levels of ICT utilization across groups. Research has shown that teachers' ICT competence and attitudes toward digital technologies are strongly influenced by the level of school support and technological resources available in their institutions (Caratiquit & Javier, 2025). Similarly, studies on digital transformation in education reveal that teachers' ability to integrate ICT effectively in teaching is closely associated with their digital competence and self-efficacy rather than demographic attributes such as gender or age (Zhang, 2025). Further research indicates that digital transformation initiatives in schools can improve teaching practices and administrative efficiency when adequate training, infrastructure, and institutional policies support technology integration (Sun, 2025). Additionally, studies on teacher digital competence emphasize that continuous professional development and institutional support systems contribute significantly to the successful implementation of digital educational programs and to the creation of consistent perceptions of ICT initiatives among teachers, regardless of demographic characteristics (Baytar, 2023).

Conclusion

The study concludes that teachers have a high level of ICT utilization across service delivery, program effectiveness, teacher support, and digitization of services, indicating strong adoption of ICT in remote schools. This supports both Utilization Theory and the Technology Acceptance Model, showing that teachers find ICT useful and easy to use in their work. No significant differences were found when grouped by age, sex, length of service, and educational attainment, indicating consistent ICT use across demographics. However, improvements are still needed in technical support, system usability, and training materials to further strengthen ICT implementation in schools.

Recommendation

Schools should improve how they provide ICT services by hiring more staff, organizing technical support, and upgrading their infrastructure. Teacher feedback should be used to regularly evaluate programs, and teachers should have access to clear materials, training, and mentoring to help them feel confident and improve their skills. School leaders offer workshops, keep an eye on teachers, and provide ongoing support to encourage teachers to use ICT tools regularly and take part in professional development. Policymakers should make ICT integration stronger by giving money for infrastructure, expanding training, and making programs like SAFER permanent. Students should make the most of digital resources, and communities should push for better ICT programs. Ongoing and forthcoming research ought to evaluate the effects of ICT within more extensive contexts. In general, these suggestions fit with the Department of Education's plan for digital transformation and SDG 4 (Quality Education). They encourage learning spaces that are open to everyone and use technology.

Conflict of Interest

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The authors declare that they have no conflicts of interest concerning the conduct, authorship, or publication of this research. All procedures and interpretations were carried out independently, with no financial, professional, or personal relationships influencing the study's results.

References

Abun, D., et al. (2024). Teacher demographics and professional engagement in educational institutions. *International Journal of Educational Management, 38*(2), 145–160.

Agonas, R., et al. (2024). Infrastructure readiness and ICT utilization in educational institutions. *Journal of Educational Technology Systems, 53*(1), 77–92.

Agyei, D. D. (2021). Building digital capabilities among teachers for sustainable ICT integration. *Education and Information Technologies, 26*(5), 5231–5248. https://doi.org/10.1007/s10639-021-10435-7

Albert, J. R. G., et al. (2023). Challenges in achieving SDG 4 in the Philippines: Data systems, infrastructure, and educational equity. *Philippine Institute for Development Studies Discussion Paper Series*.

Alastor, J., et al. (2025). Institutional support and digital competence among teachers. *Journal of Educational Computing Research, 63*(1), 45–63.

Alieto, E. O., et al. (2024). Gender and teachers' attitudes toward digital learning technologies. *International Journal of Learning, Teaching and Educational Research, 23*(4), 88–104.

Althubyani, A. (2024). Digital competence and ICT integration among teachers in modern educational settings. *Education Sciences, 14*(2), 215–229.

Amemasor, J., et al. (2025). Continuous professional development and ICT competence among educators. *International Journal of Instructional Technology and Distance Learning, 22*(1), 55–71.

Amanonce, J. (2025). ICT integration and teacher competence in Philippine schools. *Asia Pacific Journal of Educational Research, 8*(1), 101–118.

Amilusholihah, R. (2024). Strengthening teachers' digital competence for educational transformation. *Education and Information Technologies, 29*(3), 3105–3121.

Amilusholihah, R., et al. (2024). Digital competence and educational transformation in schools. *Journal of Digital Learning in Teacher Education, 40*(2), 120–136.

Annemann, K., et al. (2025). Professional development and teachers' ICT integration practices across countries. *Computers & Education, 210*, 104998. https://doi.org/10.1016/j.compedu.2023.104998

Apriyantopo, W., & Aprianingsih, A. (2022). ICT modernization and institutional development in Asia. *Asian Journal of Technology Management, 15*(2), 134–149.

Arras-Vota, A., et al. (2023). Gender differences in digital self-efficacy among educators. *Education and Information Technologies, 28*(6), 6721–6740.

Aydin, S. (2024). Digital technologies and teaching efficiency in educational institutions. *Journal of Educational Technology Development and Exchange, 17*(1), 65–82.

Aydin, S., et al. (2024). Institutional support and digital competence in teaching quality enhancement. *International Journal of Educational Technology in Higher Education, 21*(4), 1–19.

Bacud, M., & Siddayao, J. (2024). Online document request systems and digital transformation in schools. *Philippine Journal of Educational Technology, 11*(2), 55–71.

Baruela, R., et al. (2025). Institutional readiness for digital transformation in Philippine schools. *Asian Education Studies, 10*(1), 30–48.

Basilotta-Gómez-Pablos, V., et al. (2022). Teachers' digital competence and ICT training effectiveness. *Education Sciences, 12*(4), 256–272.

Baytar, F. (2023). Professional development and digital competence among educators. *Journal of Educational Innovation, 9*(3), 201–219.

Bernhard, J., et al. (2024). Gender composition in the teaching profession and educational participation. *Teaching and Teacher Education, 135*, 104381. https://doi.org/10.1016/j.tate.2023.104381

Bete, M., & Collera, A. (2025). Learner information systems and connectivity challenges in remote schools. *Philippine Journal of Information Systems, 9*(1), 88–102.

Bui, T. (2023). Digital transformation initiatives in educational institutions. *International Journal of Educational Reform, 32*(2), 211–228.

DOI: https://doi.org/10.56738/issn29603986.geo2026.7.215
ISSN 2960-3986
GEO Academic Journal Vol. 7 No. 3 – 2026 series

Cao, Y., et al. (2025). Perceived usefulness and teachers' intention to use ICT in EFL instruction. *Computers & Education, 205*, 104885. https://doi.org/10.1016/j.compedu.2023.104885

Caratiquit, K., & Javier, E. (2025). School support, techno-efficacy, and teachers' attitudes toward digital technologies. *International Journal of Educational Technology, 19*(2), 145–162.

Cheng, M., & Parker, D. (2023). Technical support systems and teachers' ICT confidence. *Educational Technology Research and Development, 71*(5), 2011–2028.

Chicco, D., et al. (2025). Statistical methods for comparing independent groups in educational research. *Journal of Applied Statistics, 52*(3), 450–468.

Chin, K., et al. (2022). ICT challenges in remote educational settings. *Asia Pacific Education Review, 23*(2), 233–247.

Ching, T., & Jamaludin, S. (2025). Perceived usefulness and ease of use in educational technology adoption. *Computers in Human Behavior Reports, 9*, 100248. https://doi.org/10.1016/j.chbr.2024.100248

Claud, R., & Dalisay, M. (2024). Gender and procedural efficiency in educational technology adoption. *Philippine Educational Research Journal, 15*(1), 56–70.

Colegado, R. (2025). Infrastructure limitations and ICT service consistency in schools. *Journal of Educational Infrastructure, 12*(2), 89–103.

Creswell, J. W., & Creswell, J. D. (2019). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Department of Information and Communications Technology. (2022). *Digital transformation initiatives in education*. https://www.dict.gov.ph

Duruin, M., & Siddayao, J. (2024). School records management systems and ISO 25010 compliance. *Philippine Journal of Educational Management, 13*(1), 15–32.

Eliver, P., et al. (2023). Teachers' research and data management skills in the digital era. *Journal of Educational Research and Practice, 13*(2), 210–225.

Eze, S. C., et al. (2018). ICT service delivery and organizational productivity in education. *Education and Information Technologies, 23*(4), 1563–1580.

Fahmiyah, N., et al. (2023). Digital confidence and ICT adoption among younger teachers. *International Journal of Emerging Technologies in Learning, 18*(7), 88–104.

Frontiers in Education. (2025). Professional development and teacher self-efficacy in digital instruction. *Frontiers in Education, 10*, 145–160.

Gao, P., et al. (2019). Program effectiveness and ICT interventions in educational settings. *Evaluation and Program Planning, 74*, 135–143.

Gatcho, A., et al. (2024). ICT implementation and teacher workload in Philippine schools. *Philippine Journal of Education, 98*(1), 77–91.

Getenet, S., et al. (2024). Performance expectancy and facilitating conditions in technology adoption. *Technology, Pedagogy and Education, 33*(2), 201–219.

Gil-Flores, J., et al. (2024). Organizational support and ICT integration in schools. *Computers & Education, 198*, 104754. https://doi.org/10.1016/j.compedu.2023.104754

Guillén-Gámez, F. D., et al. (2023). Teachers' digital competence and ICT integration. *Education and Information Technologies, 28*(8), 9123–9142.

Haleem, A., et al. (2022). Digital technologies in education: Benefits and challenges. *Sustainability, 14*(3), 1234–1250.

Huang, Y., et al. (2024). ICT-focused professional development and instructional strategies. *Computers & Education, 201*, 104803. https://doi.org/10.1016/j.compedu.2023.104803

Hussain, M., et al. (2025). Technical troubleshooting and teacher confidence in digital learning. *Educational Technology Research and Development, 73*(1), 95–114.

Ibrahimi, E., et al. (2024). System design and ICT infrastructure for educational institutions. *Journal of Information Technology Education, 23*, 301–320.

Indrayadi, T. (2020). Total population sampling in educational research. *International Journal of Research Methodology, 5*(2), 45–52.

DOI: https://doi.org/10.56738/issn29603986.geo2026.7.215
ISSN 2960-3986
GEO Academic Journal Vol. 7 No. 3 – 2026 series

Johfre, S., & Saperstein, A. (2023). Age as a social science variable and mechanism of inequality. *Annual Review of Sociology, 49*, 215–234.
Karimi, H. (2025). Institutional support and barriers to advanced digital technology use among teachers. *Journal of Educational Technology Systems, 54*(1), 75–93.
Karlen, Y., et al. (2020). Years in service and teacher professional knowledge. *Teaching and Teacher Education, 89*, 102987. https://doi.org/10.1016/j.tate.2019.102987
Kaufman, R., et al. (2023). Biological and social dimensions of sex in research. *Social Science & Medicine, 320*, 115682.
Kayanja, J., et al. (2025). Digital systems and workflow efficiency in educational institutions. *International Journal of Educational Development, 101*, 102844.
Ladines, M. (2023). ICT implementation and teacher workload challenges. *Philippine Educational Technology Journal, 7*(1), 50–67.
Latupeirissa, R., et al. (2025). Digital inequality and technology adoption in education. *Technology in Society, 78*, 102490.
Liu, X., et al. (2025). Automated systems and digital transformation in education. *Computers in Human Behavior, 154*, 107038. https://doi.org/10.1016/j.chb.2024.107038
Lomos, C., et al. (2023). ICT utilization among teachers in educational environments. *Educational Technology Research and Development, 71*(4), 1781–1799.
Loureiro, A., et al. (2024). Teachers' professional digital competence and educational technologies. *Education Sciences, 14*(4), 402–420.
Lund, A., & Aagaard, T. (2022). Technology adoption initiatives in education. *Teaching and Teacher Education, 115*, 103730. https://doi.org/10.1016/j.tate.2022.103730
Magnuson, K., et al. (2016). Educational attainment and human capital development. *Annual Review of Sociology, 42*, 413–435.
Mancilla-Díaz, J., et al. (2023). Older teachers and structured ICT support systems. *Education and Information Technologies, 28*(7), 8115–8130.
Marquez-Baldó, M., et al. (2025). ICT support and professional productivity among teachers. *Journal of Digital Learning Research, 16*(2), 115–132.
Mazman Akar, S., et al. (2025). Digital transformation awareness among teachers. *Educational Technology & Society, 28*(1), 44–59.
Mella, J., & Peña, R. (2019). Project GEARS and cloud-based school archiving systems. *Philippine Journal of Educational Administration, 6*(2), 66–81.
Mishra, P., et al. (2019). Descriptive statistics and normal distribution assumptions in research. *Annals of Cardiac Anaesthesia, 22*(1), 67–72.
Momdjian, M., et al. (2024). Digital competencies of preservice and in-service teachers. *Computers & Education Open, 5*, 100142.
Moreira-Choez, J., et al. (2024). Institutional context and teachers' ICT competencies. *Education and Information Technologies, 29*(5), 5673–5690.
Moser-Plautz, S., & Schmidthuber, L. (2023). Service digitalization and workflow transformation. *Government Information Quarterly, 40*(3), 101824.
Msambwa, N., et al. (2024). Infrastructure and technical support in ICT integration. *Journal of Educational Computing Research, 62*(2), 265–284.
Nagel, L. (2025). Teachers' adaptation to digital educational environments. *Technology, Knowledge and Learning, 30*(1), 45–63.
Nagrama, R., et al. (2024). Digital transformation and administrative efficiency in Philippine schools. *Philippine Journal of Educational Innovation, 8*(1), 92–108.
Negrín-Medina, M., et al. (2022). ICT preferences among older educators. *Education and Information Technologies, 27*(8), 11255–11274.
Nelson, L. (1980). Reliability and measurement consistency in educational research. *Educational Measurement Quarterly, 4*(1), 12–19.
Nuutinen, M., & Bordi, L. (2025). Digital platforms, technostress, and teacher productivity. *Computers & Education, 208*, 104930.

DOI: https://doi.org/10.56738/issn29603986.geo2026.7.215
ISSN 2960-3986
GEO Academic Journal Vol. 7 No. 3 – 2026 series

Okose, E. (2024). Teaching experience and pedagogical competence. *International Journal of Educational Practice, 15*(1), 99–117.
Opingo, P. (2026). Institutional support and ICT competence among teachers. *Journal of Educational Technology Development, 18*(1), 33–49.
Osiesi, M., et al. (2025). Postgraduate education and instructional innovation among teachers. *Teaching and Teacher Education, 140*, 104512.
Osorio-Vanegas, M., et al. (2025). Professional development and digital competence in education. *Education Sciences, 15*(2), 188–205.
Patton, M. Q. (1997). *Utilization-focused evaluation: The new century text* (3rd ed.). SAGE Publications.
Peng, Y., et al. (2024). Digital confidence and technology adoption among teachers. *International Journal of Educational Technology in Higher Education, 21*(1), 65–81.
Purwadi, A. (2024). Digital literacy and ICT-based educational services. *Journal of Educational Media and Technology, 19*(3), 211–229.
Republic Act No. 10173. (2012). *Data Privacy Act of 2012*. Official Gazette of the Republic of the Philippines.
Republic Act No. 11032. (2018). *Ease of Doing Business and Efficient Government Service Delivery Act of 2018*. Official Gazette of the Republic of the Philippines.
Revuelta-Domínguez, F. I., et al. (2022). Digital teaching competence and professional development needs. *Education Sciences, 12*(5), 342–359.
Risquez, A., et al. (2023). DigCompEdu framework and teachers' digital competence assessment. *Computers & Education, 190*, 104610.
Roda, C., & Antonio, J. (2025). Online document request systems and service delivery efficiency. *Journal of Educational Administration and Information Systems, 14*(1), 58–76.
Romero-Carazas, R., et al. (2025). Older educators and digital support preferences. *International Journal of Educational Research Open, 6*, 100315.
Roselló, G., et al. (2025). Teachers' preferences for real-time technical support. *Computers in Schools, 42*(1), 35–51.
Sa'diyah, H., & Prasetiyo, A. (2023). ICT integration and structured support among older teachers. *Journal of Educational Technology Systems, 52*(2), 188–205.
Saefulrahman, A., et al. (2025). Digital records systems and educational collaboration. *Education and Information Technologies, 30*(1), 499–517.
Saif, N., et al. (2022). ICT adoption and school productivity in Asia. *International Journal of Educational Development, 89*, 102557.
Scheirlinckx, F., et al. (2025). Age, teaching competencies, and instructional practices. *Teaching and Teacher Education, 142*, 104601.
Sergeeva, T., et al. (2024). ICT competence beliefs and demographic characteristics among teachers. *Education Sciences, 14*(6), 610–628.
Servancia, M., & Escarlos, J. (2025). Digital competence and action research capabilities among teachers. *Philippine Journal of Educational Research, 17*(2), 122–139.
Shin, H., & Kang, J. (2025). Governance and human resource development in educational modernization. *Asia Pacific Journal of Education, 45*(1), 77–94.
Songkram, N., & Osuwan, H. (2022). Extended technology acceptance model among K–12 teachers during COVID-19. *Education and Information Technologies, 27*(7), 9631–9650.
Sulistiani, R., & Dewi, P. (2024). Digital competence and educational quality. *Journal of Educational Innovation and Technology, 11*(2), 144–159.
Sullivan, G. M. (2011). A primer on the validity of assessment instruments. *Journal of Graduate Medical Education, 3*(2), 119–120.
Sun, Y. (2025). Digital transformation and administrative efficiency in schools. *Educational Management Administration & Leadership, 53*(1), 88–107.
Taber, K. S. (2018). The use of Cronbach's alpha in research instruments. *Research in Science Education, 48*(6), 1273–1296.
Timotheou, S., et al. (2022). Digital technologies and instructional practices in schools. *Computers & Education, 192*, 104649.

DOI: https://doi.org/10.56738/issn29603986.geo2026.7.215
ISSN 2960-3986
GEO Academic Journal Vol. 7 No. 3 – 2026 series

Timotheou, S., et al. (2023). ICT integration and digital transformation in education. *Education and Information Technologies, 28*(10), 13145–13169.

Tomczyk, Ł. (2024). Teachers' digital competence and technology integration. *Education Sciences, 14*(3), 255–272.

Vidal-Esteve, M., & Martín-Gómez, S. (2023). Digital learning tools and student engagement. *Education and Information Technologies, 28*(9), 11421–11439.

Viernes, R. (2025). Technical capacity-building needs among teachers. *Philippine Journal of Teacher Education, 14*(1), 99–118.

Weiss, C. H. (1979). The many meanings of research utilization. *Public Administration Review, 39*(5), 426–431.

Wingens, M. (1990). Utilization theory and systemic research application. *Knowledge in Society, 3*(2), 27–41.

Yang, Y., et al. (2025). Teaching experience and professional development effectiveness. *Teaching and Teacher Education, 141*, 104566.

Zakir, M., et al. (2025). Digital literacy, self-efficacy, and academic performance. *Computers & Education, 206*, 104901.

Zhang, L. (2025). Digital modernization and educational governance. *Educational Policy Analysis Archives, 33*(12), 1–22.

Zhang, Y., et al. (2023). Younger teachers and digital confidence in educational settings. *International Journal of Educational Technology, 20*(4), 301–319.

Zou, D., et al. (2025). Sustainable ICT integration and professional development in education. *Computers & Education, 208*, 104936.