

Effectiveness of an ICT-Skills Enhancement Short Course Program for Barangay Functionaries ICT-Based Office Operation

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Abstract. In an era marked by rapid technological advancements, the role of local government officials and functionaries is transforming due to the growing integration of information and communication technology (ICT) into governance processes. This study aimed to assess the effectiveness of the ICT-Skills Enhancement Short Course program for enhancing ICT-based operations among Barangay Functionaries within the rural context of the 10 Barangays in the Municipality of Hagonoy, Davao del Sur. This study employed a descriptive-pre-experimental research design, specifically the one-group pre-test post-test design, to assess the effectiveness of the intervention by comparing participants' measurements before and after the intervention. Before the implementation of the ICT Skills Enhancement Short Course program, the descriptive rating indicated a developing stage, suggesting that participants had only acquired a minimum level of knowledge. Following the implementation, the participants' level of skill transitioned from developing to proficient. Using a paired sample T-test, results revealed a significant difference in the level of skills before and after the implementation. These findings underscore the importance of adopting the ICT Skills Enhancement Short Course program to enhance government services in barangays.

Keywords: Public administration; Barangay functionaries; Descriptive; Pre-experimental; Philippines.

1.0 Introduction

The emergence of Information Communication Technology (ICT) significantly contributes to improving the productivity and efficiency of government personnel, including those at the barangay level. By leveraging ICT tools and platforms, these employees can streamline administrative tasks, document creation, data management, and communication with constituents. However, not all of the barangay functionaries possess the necessary skills for them to be efficient in the mentioned technology. As such, instead of making work easier, several concerns and problems arise. They find it difficult to incorporate ICT in their paperwork and in accomplishing their tasks.

This issue has become apparent among individuals residing in rural regions who have limited educational opportunities and are entrusted with governmental duties and obligations. For example, Matli and Ngoepe (2020) uncovered that a majority of rural residents in South Africa lack proficiency in utilizing Information and Communication Technology (ICT). They have a hard time making use of technology to help them accomplish their tasks, especially in submitting documents, editing texts, and many others. Therefore, their ability to engage effectively in economic endeavors is hindered by their insufficient grasp and expertise in ICT skills (Mumporeze & Prieler, 2017). In Egypt, introducing e-government faces challenges because workers worry about job security, fear consequences, and do not have much technology training (Elgohary & Abdelazyz, 2020). Also, Brazil faces low productivity linked to weak ICT skills (OECD, 2018). Consequently, Matli and Ngoepe (2020) revealed that South Africa has undertaken continuous digital literacy skills training and development to create a skilled

population capable of effectively utilizing and benefiting from technology. Similarly, in both Egypt and Brazil, organizations have implemented training programs to enhance their employees' awareness of e-government.

Meanwhile, in the ASEAN context, Jakarta Post (2016) revealed that there is a disproportion regarding the workload of government employees in the country. While the departments composed of ICT experts are given a bunch of work to do, the other departments would just rely on and pass the job of encoding and facilitating some procedural work to the office with ICT experts. Furthermore, Nam et al. (2015) assert that the scarcity of individuals equipped with advanced ICT knowledge and skills in Myanmar presents a significant challenge that must be tackled, particularly as ICT increasingly becomes fundamental to the development process. Moreover, a study conducted in the Upazila Region of Bangladesh revealed that a deficiency in skilled personnel and concerns among public employees about adopting technology pose barriers to delivering ICT-enabled services (Karim & Hosen, 2023). In the country of Malaysia, it is recommended that executives look into the possibility of having a capacity building for all employees to engage from basic to higher-level ICT competence (Siti et al., 2017). With this, all workers will be able to work efficiently using the technology. Therefore, implementing ICT training programs with comprehensive pedagogies for digital learning is crucial for fostering ICT skills development and addressing the issue in Myanmar.

In the Philippines, the duties and obligations outlined for barangay secretaries and treasurers in Republic Act No. 7160, also known as the Local Government Code of 1991, predominantly entail the use of computer applications. This statutory provision underscores the necessity for proficiency in computer usage. However, the mentioned functionaries in the country also struggle in terms of utilizing ICT accordingly. As Batara (2017) expounded, several employees tend to be apprehensive about using computers. They think that using ICT requires more effort. In Barangay Silang, Cavite, barangay workers have encountered difficulties in utilizing ICT, hindering the efficiency of their tasks (Cereneo et al., 2021). However, it is worth noting that the skills obtained by barangay officials from attending ICT seminars and training sessions have provided them with a distinct advantage in effectively incorporating ICT into their daily activities.

In the local context, the researcher administered an initial survey to other individuals who were not part of the designated respondents. The survey results indicated that they encountered various challenges in using essential tools like Microsoft Word, creating basic presentations, and working with formulas in Excel. They also struggled with encoding data in Excel forms. Additionally, the pre-survey findings highlighted a common issue in office transactions: printer problems leading to delays. Many recipients lacked the necessary knowledge to troubleshoot printer issues effectively. Thus, this indicates a need for support and training in these areas to enhance their proficiency and streamline office processes. The abovementioned scenarios highlight a significant issue concerning the lack of proficiency in using Microsoft applications, video conferencing tools, and basic computer troubleshooting. Further, the current skill gap affects the productivity and efficiency of the Barangay workforce.

To address the problem stated above, the researcher created a training program called ICT-Skills Enhancement Short Course Program. It is an innovative intervention designed to tackle the challenges stemming from the manual execution of office tasks, which impede operational efficiency and lead to delays in document production.

In the context of this research, the Technology Acceptance Model (TAM), introduced by Davis in 1989, serves as a theoretical foundation. When an individual perceives that a technology is easy to use and holds a positive view of its capabilities, they are more inclined to accept and utilize the technology. This assumption implies that one tends to adopt technology when he/she believes it will enhance his/her performance or will make tasks easier and more efficient. In the present study, this assumption can be applied since it can help us understand the process of implementing the ICT-Skills Enhancement Short Course Program on how this program is adopted by barangay functionaries and integrated into their ICT-Based Office Operation.

The program's perceived ease of use refers to how user-friendly and intuitive participants find the training. The perceived usefulness of the program relates to how beneficial the skills for their work that the participants will acquire. By applying TAM, the research can evaluate how these perceptions impact the willingness of barangay

functionaries to embrace and incorporate the ICT skills they have gained from the program into their everyday responsibilities.

2.0 Methodology

2.1 Research Design

This study, following a descriptive pre-experimental research design advocated by De Langen (2009) and Romah (2016), employed the one-group, pre-test post-test design. The descriptive aspect involved assessing participant's ICT skills before and after the program using survey questionnaires, providing insights into present conditions and variations among objects. The pre-experimental design was chosen due to only one group undergoing the intervention, devoid of random assignment or a control group. This design entailed pre-test and post-test measurements, lacking a separate control group for comparison. The one-group pretest-posttest design administered a pretest, followed by the intervention, and then a post-test to measure the dependent variable.

2.2 Research Locale

The study focused on assessing the ICT-Skills Enhancement Short Course Program's effectiveness in Hagonoy Municipality, specifically in rural barangays. It involved 30 respondents from 10 barangays, excluding urban areas near Poblacion and barangays outside the municipality. The study lasted three months from June to August 2023. The effectiveness of the program was analyzed using the Paired Sample T-test.

2.3 Research Participants

The study's respondent selection criteria prioritized inclusivity and relevance. One administrative staff member, recommended by the Barangay Captain, treasurer, and secretary, was included to ensure comprehensive representation. However, Barangay Captains and Councilors were excluded due to their elected positions, subject to change with upcoming elections.

2.4 Research Measures

The researcher made a training module which is comprised of six (6) training lessons. Before its implementation, the modules were assessed by the ICT experts to ensure that the researcher's modules met the standards of ICT experts. This study utilized a researcher-made survey instrument employing a pre-test and post-test approach that measures the respondents' level of ICT Skills before and after the implementation. The respondents provided their responses using a questionnaire that aligns with the module's content. This questionnaire included multiple-choice questions with options A to D, related to the module's topics. Table 1 presents an analysis of the survey findings regarding the proficiency levels before and after the introduction of the ICT-Skills Enhancement Short Course Program. A higher mean score indicated that the respondent's level of skills exceeds the core requirements while a lower mean value suggested that the respondent's struggle with their fundamental skills and need to acquire and develop ICT Skills.

Table 1. Interpretation of the level of ICT Skills before and after the Intervention

Raw Score	Equivalent	Verbal Description	Interpretation
25-30	90-100	Advance	The Barangay Functionaries at this level exceed the core requirements in terms of knowledge, skills, and understandings, and can transfer their learning to doing-based ICT Office operation that involves ICT.
19-24	85-89	Proficient	The Barangay Functionaries at this level have developed the fundamental knowledge skills and core understanding and can transfer their learning in doing-based ICT Office operation that involves ICT.
13-18	80-84	Approaching Proficient	The Barangay Functionaries at this level have developed the fundamental knowledge and skills and core understandings and with little guidance from the ICT experts and/or with some assistance from peers, can transfer their understanding in doing Office-based operation that involves ICT.
7-12	75-79	Developing	The Barangay Functionaries at this level possess the minimum knowledge and skills and core understanding but need help in doing ICT Based Office operation that involves ICT.
1-6	60-74	Beginning	The Barangay Functionaries at this level struggle with his/her fundamental knowledge and/or skills that have not been acquired/ developed adequately to do the ICT-Based office operation that involves ICT.

2.5 Data Gathering Procedure

The data gathering process involved obtaining approval from the Dean of the Graduate School, securing permission from the Municipal Local Government Operations Office, and coordinating with barangay captains to facilitate participation. Valid and reliable questionnaires were then distributed to respondents after adjustments were made. Confidentiality of respondents' identities and responses was ensured, and data were organized, tabulated, and statistically treated with the assistance of a statistician.

2.6 Ethical Considerations

The study, conducted by the authors, rigorously adhered to ethical guidelines, ensuring voluntary participation wherein individuals freely chose to join without coercion or pressure, and could withdraw without providing a reason (Bhandari, 2022). Informed consent was obligatory, with participants provided clear information about the study's purpose, procedures, benefits, and any potential conflicts of interest (Mack et. al., 2011). Lastly, *Privacy and confidentiality* were maintained, assuring participants that their personal data would remain confidential, and they would not face negative consequences for their responses (Surbhi, 2018). The use of personal data for the purposes of this study were kept in high confidentiality. Additionally, the study acknowledged the possibility of acquiescence bias and took steps to mitigate it by creating an environment where participants felt comfortable providing honest responses.

3.0 Results and Discussion

3.1 Level of ICT Skills Among Barangay Functionaries before the Intervention

As indicated in Table 2, results reveal that the level of the ICT skills of barangay functionaries before the implementation of the ICT-Skills Enhancement Short Course Program is 11.77 with development as its descriptive rating. This suggests that barangay functionaries at this level possess a foundational knowledge base and understanding but require support to further develop their ICT skills.

Table 2. Pretest result of the level ICT skills of barangay functionaries

Variable	Level of Skill	Std. Deviation	Descriptive Rating	Interpretation
ICT Skills before the implementation of the ICT-Skills Enhancement Short Course Program	11.77	3.44	Developing	The Barangay Functionaries at this level possess the minimum knowledge skills and core understanding but need help in enhancing their ICT Skills.

Furthermore, the standard deviation result of 3.44 suggests that approximately 68% of the data points are within one standard deviation of the mean. This indicates that 68% of the scores or data representing the ICT skill levels of the barangay functionaries before the enhancement program are between 8.33 and 15.21. The standard deviation further reveals that 95% of the data lie within two standard deviations or scores between 4.89 and 18.65.

3.2 Level of ICT Skills Among Barangay Functionaries after the intervention

Results, as shown in Table 3, reveal that the level of the ICT skills of barangay functionaries after the implementation of the ICT-Skills Enhancement Short Course Program is 23.33 with proficiency as its descriptive rating. This suggests that the participants at this level have acquired the essential knowledge skills and core understanding and can apply their learning in practical Office Operations that require the use of ICT.

Table 3. Posttest result of the level ICT Skills of Barangay Functionaries

Variable	Level of Skill	Std. Deviation	Descriptive Rating	Interpretation
ICT Skills after the implementation of the ICT-Skills Enhancement Short Course Program	23.33	4.25	Proficient	The Barangay Functionaries at this level have developed the fundamental knowledge and skills and core understanding and can transfer their learning in doing ICT Based Office Operation that involves ICT

Moreover, the standard deviation outcome of 4.25 suggests that approximately 68% of the data points are within one standard deviation of the mean. This indicates that 68% of the scores or data representing the ICT skill levels of the barangay functionaries after the enhancement program are between 19.08 and 27.58. The standard deviation further reveals that 95% of the data lie within two standard deviations or scores between 14.83 and 31.83.

3.3 Significant Difference in the ICT Skills of the Barangay Functionaries Before and After the Intervention

By employing the SPSS software, a Paired Samples T-Test was conducted to ascertain the statistically significant difference between the pre-test and post-test ICT Skills of barangay functionaries in the Municipality of Hagonoy, as displayed in Table 4.

Table 4. Paired Samples T-Test for pre and post-test on ICT skills

Intervention	Rating	p-value	Interpretation	Decision
Before	11.77	0.000*	There is a significant difference in the level of the ICT Skills of the Barangay functionaries before and after the intervention program	Reject the Null Hypothesis
After	23.33			

Note. *p<0.05 (significant)

The research aimed to establish whether there is a notable difference in the ICT skill levels of Barangay Functionaries before and after the implementation of the ICT-Skills Enhancement Short Course Program. To analyze the data, a Paired Samples T-test was employed. The result from the analysis indicates that there is a significant difference in the level of ICT Skills of Barangay Functionaries before and after the implementation of the ICT-Skills Enhancement Short Course Program as manifested by the sig value of .000 which is lower than the .05 level of significance set for this study. The mean values indicate that the level of the ICT skills of the barangay functionaries significantly improved after attending the ICT-Skills Enhancement Short Course Program with a mean score of 23.33 as compared to the level of their ICT skills before attending the program with a mean score of 11.77. Thus, the null hypothesis is rejected.

3.4 Discussion

As indicated in Table 2, the level of ICT skills among the Barangay Functionaries before the implementation is categorized as developing, indicating that they possess only a basic understanding of ICT skills but require more help in enhancing their ICT Skills. This result is supported by the discoveries of Matli and Ngoepe (2020), who uncovered a similar trend in rural areas of South Africa where people lacked proficiency in using information and communication technology (ICT). Consequently, their limited grasp of ICT hinders their effective participation in economic endeavors, echoing the sentiments expressed (Mumporeze & Prieler, 2017). Likewise, a study conducted in the Upazila Region of Bangladesh supported this claim which highlighted that a scarcity of skilled personnel and apprehension among public employees towards technology act as barriers to providing ICT-enabled services (Karim & Hosen, 2023).

Furthermore, it aligns with the study of Nam et al. (2015) which asserts that the deficiency of personnel equipped with advanced ICT knowledge and skills in Myanmar constitutes a substantial concern that must be tackled, considering the growing integration of ICT into developmental processes. Consequently, it is recommended that organizational leaders explore the feasibility of implementing comprehensive capacity-building initiatives for all employees, fostering the progression from basic to advanced levels of ICT competence (Siti et al., 2017).

On the contrary, there was a study that disagreed with the present findings. A study by Amin (2018) asserts that individuals residing in rural areas have actively engaged with information and communication technology (ICT). Amin's 2018 research sheds light on the fact that ICT usage has exceeded geographical boundaries, reaching even those in rural communities, thus offering a more diverse picture of its adoption and impact. This underscores the relevance of the research, which looks at how barangay functionaries in rural areas use technology, is important. It helps understand how they use technology in different situations.

Furthermore, as presented in Table 3, the level of skills following the program's implementation is described as proficient. This indicates that after the intervention, the respondents' level of skills has gone higher. This means that they have gained essential knowledge, a solid grasp of core concepts, and the ability to apply their learning to perform ICT-based office operations involving technology.

The study's findings align with previous research, demonstrating that barangay officials' skills improve through participation in ICT seminars and training, ultimately benefiting their ability to apply ICT in their daily lives (Santiago et al., 2020). Furthermore, it is essential to consider education and training programs as top-priority initiatives (Islam, 2019) to sustain the enthusiasm of barangay officials towards ICT adoption, a well-structured program designed by the Local Government Unit (LGU) could be implemented to not only refine their existing skills but also to align them with the evolving demands of ICT (Santiago et al., 2020).

Hence, the ICT Skills Enhancement Short Course Program can help functionaries improve their ICT Skills. Also, the same results were reported by Sagarik et al. (2018) who posited that training programs have a big help in increasing the digital literacy and ICT proficiency of public servants across the country. This finding is consistent with the results of Dukić et al. (2017) study, which emphasized the crucial need to offer ongoing training opportunities for government employees as part of their lifelong learning. This could significantly benefit barangay officials by enhancing their capacity to deliver services, manage public administration, and effectively and efficiently carry out their assigned duties.

On the contrary, this contradicts Ndou's (2015) research, which suggests that training does not consistently ensure advancement in individuals facing change. This is highlighted in the context of Competency-Based Training (CBT), as discussed in the study's analysis of capacity-building training, focusing on its efficacy and efficiency. Further, Ndou's (2015) research underscores that participation in training does not necessarily equate to immediate or definite learning outcomes. This emphasizes the need to critically evaluate the effectiveness of training programs and recognize that participation alone may not guarantee skill development programs.

Furthermore, as shown in Table 4, the analysis findings suggest a notable variance in the ICT skill levels of Barangay Functionaries before and after the ICT-Skills Enhancement Short Course Program implementation, as evidenced by the significant value being lower than the set level of significance for this study. The study's results indicate that the intervention program had a positive impact on the respondents' skill levels, demonstrating the effectiveness of the program in enhancing the respondents' efficiency and effectiveness in integrating ICT into their work. These findings are consistent with Islam et al.'s (2017) research, which highlights the value of providing ICT-related seminars to barangay officials to improve their service delivery and public administration capabilities. Additionally, the study recommends proposing a computer training design to address specific areas where respondents struggle with using ICT, as suggested by Medina et al. (2017).

Similarly, a study conducted by Bona & Camara (2021) in the Philippines concurs with these conclusions, highlighting the positive impact of training interventions encompassing computer program skills. Through workshops, tutorials, and intervention training seminars, participants experienced notable improvements in their comprehension of basic computer functions and contemporary usage. Furthermore, the insights put forth by Cereneo et al. (2021) shed light on the remarkable advantage gained by barangay officials who engage in ICT seminars and training sessions. These acquired skills not only empower them to seamlessly integrate ICT into their daily operations but also equip them with a distinct edge in navigating the dynamic landscape of modern technology.

4.0 Conclusion

Based on the results of the study, the following conclusions are drawn:

- The level of ICT skills among functionaries before the implementation is developing. This implies that the Barangay Functionaries at this level possess the minimum knowledge skills and core understanding but need help in doing ICT-Based Office operation.
- The level of ICT skills among functionaries after the implementation is categorized as proficient. This implies that Barangay Functionaries at this level have developed the fundamental knowledge and skills and core understanding and can transfer this learning in doing ICT-Based Operations.

- The changes from a developing skill level to a proficient one signifies the positive impact of the intervention in enhancing the participants' technological abilities, thereby positioning them to better navigate the digital landscape. Further, it lends support to the program's effectiveness.

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7.0 Conflict of Interests

The author declares no conflicts of interest

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