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The Role of ICT Literacy Training in Advancing Social Development and Empowerment in Rural Farming Communities

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ABSTRACT

This research looks at the social effects of the ICT learning program that Central Philippine State University (CPSU) - Information Technology ran for members of the Kabankalan, Negros Occidental, Philippines Rural Farmers Association. The study was done by two universities in the Negros Island Region (NIR) working together. To get a full picture of the program's results, the study used a mix of methods, including surveys, key informant interviews (KIIs), focus group talks (FGDs), and document analysis. The training made the attendees much smarter about technology, more productive, and more aware of environmentally friendly practices. Participants in the ICT Literacy program were able to make friends, grow as people, and become more independent, especially those working in fields that require digital tools, such as small business owners and daycare workers. But problems such as insufficient access to ICT tools, infrastructure issues, and the idea that digital tools don't belong in agriculture were identified. The study makes the point that there needs to be custom training that meets the needs of different jobs, especially when it comes to using ICT in agriculture. Some suggestions include improving digital access and providing ongoing support to ensure the effects last. The results make a strong case for how ICT literacy can improve conditions in rural farming areas. Lastly, this study provides useful insights to improve future ICT training outreach programs. This will help build rural economies in Negros Occidental that work for everyone.

Keywords

Impact Assessment, Information and Communication Technology (ICT) literacy, Social Impacts, Mixed-methods research, Farming Communities

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INTRODUCTION

Skills are taught and self-learned (Ray Chaudhury, 2021); these offer new opportunities for improvement and empowerment for better living and social community interactions (Singh & Agarwal, 2024). One area that is now very important for individuals to learn is information and communication technology (ICT) literacy, which has become essential for social development worldwide. In the community, particularly in rural areas where most are in agriculture, there is limited access to these digital tools, which is why developing ICT literacy helps bridge knowledge gaps and enhance social participation (Abdulai et al., 2023). As digital transformation accelerates worldwide, the capacity of rural populations to understand and utilize ICT tools has become increasingly important in achieving inclusive and sustainable development.

ICT literacy has become a component of social and economic development; this knowledge enables individuals to evaluate, create, and communicate information anywhere in the world using digital tools (Fernández-Portillo et al., 2020). In rural communities, ICT literacy helps close gaps in education and livelihood opportunities. Farmers in the rural community seem to have no idea of what ICT tools can do to enhance their livelihoods by providing them with market information, weather updates, and access to agricultural tools, thereby increasing the saleable scope of their products in their locality. However, these benefits can be fully realized only when individuals possess the skills to use technology confidently and effectively, underscoring the importance of dedicated ICT literacy training programs.

In local settings here in the Philippines, government agencies, academic institutions, and private industries are collaborating to expand and strengthen ICT literacy in rural areas, benefiting communities. An initiative is the ICT literacy training conducted by the Central Philippine State University (CPSU) in partnership with another university in the Negros Island Region (NIR). These trainings were designed to train rural farmer associations in Kabankalan, Negros Occidental. This program sought to improve the ICT competencies so that farmers adapt to the rapidly digitalizing society.

This research focused on providing ICT literacy to rural farming communities and advancing social development. The study provides valuable insights for designing responsive, inclusive, and sustainable ICT capacity-building programs. Lastly, the findings would contribute to digital inclusion and rural development, reinforcing the importance of empowering marginalized communities through targeted ICT education.

MATERIALS AND METHODS

This section presents the methods applied in this study to examine the role of ICT literacy training in rural farming communities. Presented in this section are data-gathering procedures, instruments used, and methods of data analysis.

Study Design

This study employs a mixed-methods approach, combining quantitative and qualitative methods to evaluate the social, economic, and environmental impacts of ICT literacy training for members of the Camingawan-Tagukon Farmers Association (CATAFA). The mixed-methods design ensures a comprehensive understanding of the training's outcomes, capturing measurable results and nuanced insights into participants' experiences.

Data Collection Methods

Structured survey questionnaires

Structured survey questionnaires were designed and administered by the Research, Innovation, Development, and Extension (RIDE) Office. The surveys included both closed- and open-ended questions, organized into social, economic, and environmental dimensions. Questions focused on digital tool usage, productivity improvements, income changes, environmental practices, and overall training satisfaction.

Key Informant Interviews (KIIs)

The NORSU-RIDE Office Team conducted KIIs with selected stakeholders. These interviews included ICT trainers, CATAFA leaders, and key participants, providing in-depth perspectives on program implementation, challenges, and opportunities for improvement. The KIIs followed a semi-structured format to allow flexibility and encourage detailed responses.

Focus Group Discussions (FGDs)

The NORSU-RIDE Office Team facilitated FGDs to gather insights from diverse participant groups, including farmers, office workers, and small business owners. Discussions focused on the practical applications of ICT training, barriers to integration, and the perceived impact on social, economic, and environmental aspects of their lives.

Respondent Selection and Sampling Technique

Purposive sampling was employed to select beneficiary respondents who completed the ICT literacy training program. This ensured representation across CATAFA's different roles, including farmers, administrative workers, and small-scale entrepreneurs. A total of 40 participants completed the survey, while 15 participated in KIIs and FGDs.

Data Analysis

Survey data were analyzed using descriptive statistics to highlight frequencies, trends, and distributions. Cross-tabulations were performed to explore relationships between variables, such as digital tool usage frequency and changes in productivity. Data from KIIs and FGDs were transcribed and thematically analyzed using coding frameworks to identify recurring themes. Key themes included digital adoption, economic opportunities, and sustainability practices. Data from surveys, KIIs, FGDs, and document reviews were triangulated to ensure the validity and reliability of findings. This approach enhanced the study's robustness by cross-verifying information from multiple sources.

Ethical Considerations

All participants were briefed on the study's objectives and their rights as beneficiary respondents, and written consent was obtained before data collection. Participant identities were anonymized during data collection, analysis, and reporting to ensure privacy. The study was conducted under the guidance and approval of the CPSU and NORSU-RIDE Office, ensuring compliance with ethical research standards.

RESULTS AND DISCUSSION

This section presents and interprets the study's findings based on data gathered from surveys, interviews, focus group discussions, and document analysis. The results are organized to highlight the key outcomes of the ICT literacy training and their implications for social development and empowerment within the rural farming community. Each finding is discussed in relation to the study's objectives, allowing for a deeper understanding of how ICT literacy influences participants' skills, behaviors, and community engagement. The discussion also integrates insights from existing literature to contextualize the results and illustrate the broader significance of the training program.

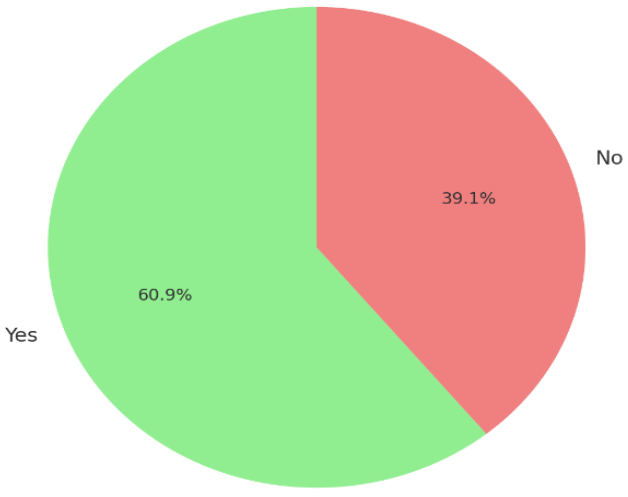

Figure 1. Connection with Others

Figure 1 shows the percentage distribution of beneficiary-respondents' perceptions of whether the program helped them connect with others. A majority (60.9%) responded "Yes," indicating that the program successfully facilitated participant connections. Conversely, 39.1%

of beneficiary respondents answered "No," suggesting that a significant minority did not feel the program contributed to building connections. These results highlight the program's overall effectiveness in fostering interpersonal connections for most participants, suggesting areas for improvement to ensure inclusivity and efficacy for all participants.

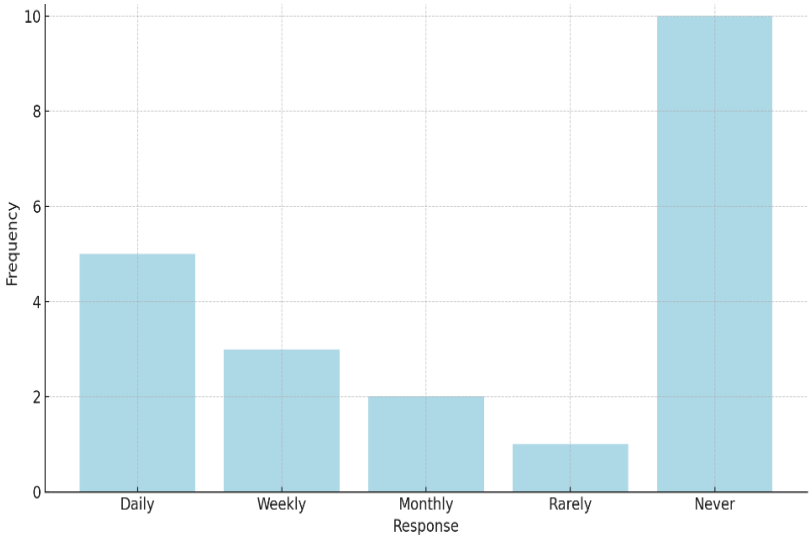

Figure 2. Frequency of ICT Skills Application to Work

Figure 2 illustrates the frequency of using computer skills among beneficiary-respondents. The "Never" category has the highest frequency, indicating that many beneficiary respondents do not use computer skills in their daily lives or work. This likely reflects specific job roles, such as farmers, where computer usage may not be required regularly. A smaller but notable portion of beneficiary respondents reported using computer skills "Daily" or "Weekly," which is likely associated with roles such as daycare workers and cashiers. These jobs often require frequent interaction with digital tools for administrative tasks, point-of-sale systems, or educational applications. A smaller number of beneficiary respondents reported using computer skills "Monthly" or "Rarely," suggesting sporadic or minimal use of digital skills, possibly due to limited job requirements or a lack of opportunities to practice them. Overall, the results highlight a divide in the use of computer skills. Many beneficiary respondents, especially farmers, do not engage with computers, while others in more technology-reliant roles, such as cashiers and daycare workers, use these skills more frequently. The findings supported by Khatri et al. (2024) support the need for targeted strategies to integrate technology into diverse job settings, including agriculture, to maximize the utility of ICT training.

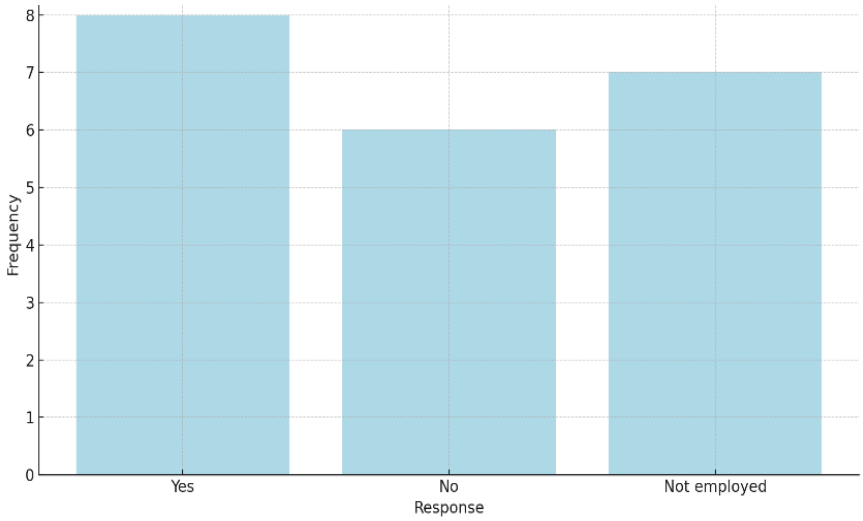

Figure 3. Computer Application in Current Jobs

Many beneficiary respondents answered "Yes," indicating that they actively use computer skills in their roles. This likely applies to daycare workers and cashiers, whose responsibilities increasingly involve digital tools such as attendance tracking systems, inventory management, and point-of-sale (POS) systems. Conversely, many beneficiary respondents selected "No," suggesting that their jobs do not require computer skills. This response is likely more relevant to farmers, as agricultural work often relies less on direct computer usage, especially in traditional or small-scale farming contexts. A similar portion of beneficiary respondents indicated they are "Not employed," reflecting individuals who may not currently have jobs where they can apply their ICT training or are seeking employment opportunities. As suggested by Mapiye et al. (2023), farmers may integrate ICT into agriculture or other job opportunities that combine farming and technology.

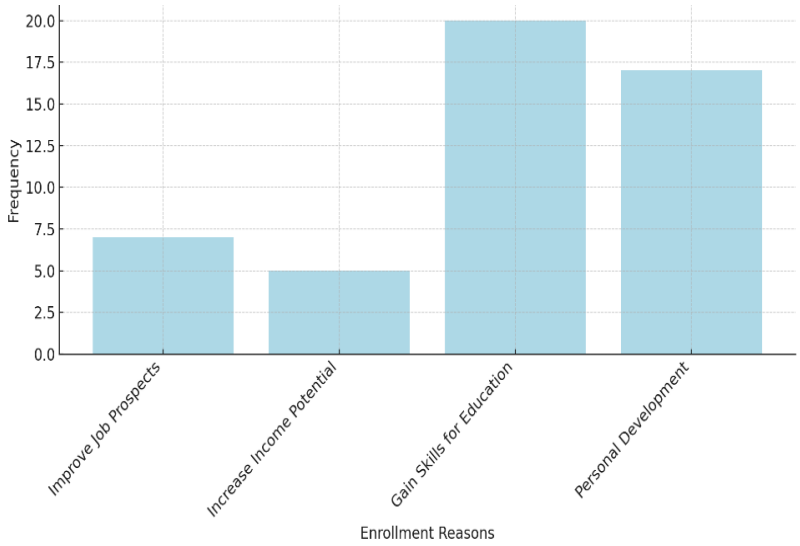

Figure 4. Reasons for Participating in the ICT Training

Figure 4 illustrates the various reasons for enrollment among beneficiary respondents. The most common cause is to gain skills for education, which has the highest frequency, indicating its importance as a primary motivator. This is closely followed by personal development, suggesting that many beneficiary respondents see enrollment as a way to improve themselves. Improving job prospects is a less common reason, suggesting that some beneficiary respondents view enrollment as a step toward better career opportunities. Increasing income potential is the least-mentioned reason, suggesting that financial incentives are not a primary concern for most beneficiary respondents.

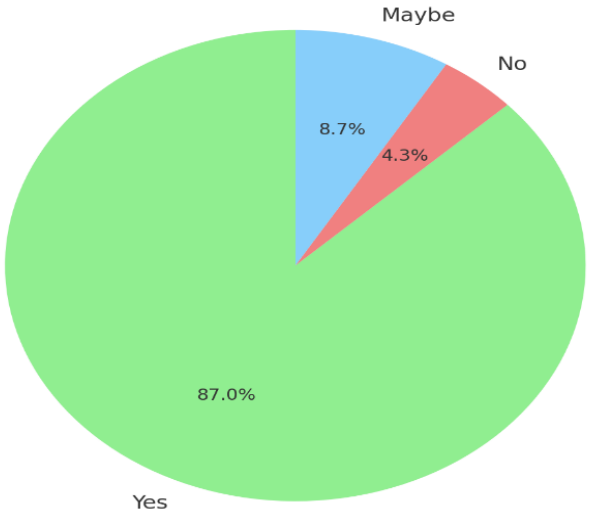

Figure 5. Interest in Further Training

Figure 5 shows that 87% of respondents expressed interest ("Yes"), indicating strong enthusiasm and a willingness to pursue additional training opportunities. A smaller portion, 8.7%, responded with uncertainty ("Maybe"), suggesting they might consider training depending on specific circumstances or conditions. Only 4.3% of beneficiary respondents indicated no interest ("No"), representing a small fraction of the group. These results highlight a significant demand for further training, with most beneficiary respondents eager to enhance their skills or knowledge. The small percentage of those unsure or uninterested suggests that targeted engagement or tailored programs could increase participation among these groups. The data reflects a positive attitude toward skill development and learning opportunities.

What Happens to Society When You Teach ICT Literacy

People who took the ICT literacy training had different impacts on their social lives, showing both its pros and cons in a farming community in the country. Most of the participants said the program helped them meet new people. This shows that ICT training can help people get along with others by making it easier to talk to them when they are not in the same room. This finding supports earlier claims that learning to use ICT improves social involvement by making it easier for people to use shared information spaces and participate in community activities (Fernández-Portillo et al., 2020; Zainal Abiddin et al., 2022).

Consistent with studies emphasizing the social dimension of digital literacy, participants who experienced greater connectivity looked better positioned to collaborate, share information, and sustain interpersonal relationships within their community (Kenzhegalieva & Alimbaeva, 2023). An important part of the survey was that many people did not think their social ties had gotten better. This shows that

ICT training by itself does not always lead to social inclusion. It is the same in rural areas, where people do not have less access to technology, work from home, or good infrastructure. These factors make ICT projects less valuable to society (Nyika, 2020; Mansour, 202400). These findings show that social effects depend on both how ready each person is and how much teamwork and contact are intentionally encouraged during training.

Changes in the work setting also affected the social benefits of learning ICT skills. People whose jobs involved technology said they used their computer skills more and had more chances to connect with others online. However, farmers and unemployed people said they did not use their ICT skills very often. Previous study (Norton & Alwang, 2020; Mapiye et al., 2023) has shown that digital tools are not well integrated into traditional farming methods. As we see in rural farming areas, farmers still cannot fully use digital technologies because they are hard to reach, do not see them as applicable, and what they learn in ICT classes does not work in real farming settings (Abdulai et al., 202303). The economic and social benefits of ICT are both limited when it is not used as much. This is because less use means fewer opportunities for people to learn from one another, share knowledge, and connect with others in the community.

It has been found that farmers do not always see how ICT fits into their daily lives. As Mukred et al. (2021) and Liu et al. (2025) note, this is especially true when training does not make it clear how it fits into farming jobs, such as going to markets, keeping records, or making decisions about climate change. Even with these issues, the fact that so many people want to improve themselves and learn more shows that they are more interested in doing so than in making money right away. Some studies (Ray Chaudhury, 2021; Singh & Agarwal, 2024) have shown that people in rural areas often see ICT training as a way to gain personal power and keep learning throughout their lives. The results show how important it is to have ICT programs that are socially responsive, occupation-sensitive, involve users in the planning process, and offer ongoing mentoring. People can use ICT literacy not only as a set of technical skills, but also to stay active in their communities and gain more power (Khatri et al., 2024; Maxwell & Babagana, 2024).

Conclusion and Recommendations

The social effect of the ICT program shows important patterns in how people use technology and how that use affects their personal and professional lives. Most of the program's beneficiaries (60.9%) said that it helped them connect with others. This shows that ICT training can help people get along with each other and interact socially. But the other 39.1% did not experience this gain, indicating that problems with inclusion and engagement need to be addressed. The ways ICT skills are used also vary widely across jobs. People who worked in jobs that required a lot of technology, like cashiers and daycare workers, said they used their computer skills a lot. But farmers and people who worked in fields that didn't use much technology said they rarely or never used them. This difference shows that ICT isn't equally applicable across all fields, especially in agriculture, where digital tools aren't widely used. Many of the interviewees use their computer skills at work, but a large share don't. This shows that opportunities to incorporate ICT into some areas of people's lives were missed. The main reasons people join the school are to improve their skills and grow as people, and 87% say they want more training. On the other hand, job advancement and financial incentives had a lesser effect, suggesting that participants care more about improving themselves than about making money right away.

The program has helped many people learn and connect with others, but the results show that we need more methods that are open to everyone and take occupation into account. The large number of responders who did not feel more socially connected shows how important it is to change activities so that more people can participate. In the same way, the fact that farmers and unemployed participants don't use their ICT skills much shows that there is an untapped possibility for using technology to help people make a living. This could be addressed through ICT training tailored to each job, especially on farmland using digital farming tools and apps. Since there is a strong desire to keep learning, program planners should focus on creating training opportunities that are easy to access and flexible, that build on people's natural desire to grow as individuals. Creating partnerships with private, non-governmental, and local government groups can help develop ICT hubs, improve connectivity, and make devices more cheap. Over time, skills can also be enhanced with ongoing mentorship programs, follow-up technical support, and online help lines. Sustainability topics, such as managing e-waste, using ICT in an energy-efficient way, and eco-friendly farming methods, can be taught alongside financial literacy topics, such as digital payments and microfinance. This can give people even more useful, long-lasting, and financially viable skills.

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Conflicting Interest

The authors declared no conflict of interest in the preparation and publication of this research.

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Contribution

The authors contributed to the overall conduct and writing of the study.

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