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# Exploring Digital Knowledge in a Rural East Java Community

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**Abstract** This paper presents an initiative aimed at introducing digital skills to a rural community in East Java, Indonesia. A training workshop on the use of electronic surveys was conducted through a classroom-style presentation. The session included a simple step-by-step tutorial, hands-on practice using a smartphone-based electronic survey form, and a demonstration of how the survey results could be visualized. Thirty adult participants, both men and women, from the village of Karangpakis, Kabuh Regency, East Java, took part in the workshop. The findings indicate that the community service activity highlighted both challenges and opportunities for digital empowerment, which are analyzed in three key areas: (1) the delivery of an accessible workshop that enabled participants to practice using an online survey application; (2) the significance of introducing technology to enhance communication regarding village welfare; and (3) the advancement of participants' digital literacy through exposure to the practical benefits of the survey results. The paper concludes by discussing implications for sustainable engagement and directions for future research.

## 1. INTRODUCTION

The rapid advancement of information and communication technology has compelled global communities to incorporate digital tools into their everyday activities. The COVID-19 pandemic accelerated this shift and significantly increased the reliance on digital solutions in place of hardcopy materials or face-to-face interactions. Although many individuals now own telecommunication devices such as smartphones, which facilitate better information access and expedite personal and commercial processes like shopping and socializing, the broader impact of technology use beyond ownership statistics remains underexplored. This is especially true in the context of rural communities and their basic digital competencies, particularly regarding the use of electronic surveys.

Electronic surveys have transformed how individuals generate, collect, and manage data by offering faster and more cost-effective alternatives to traditional methods. However, despite early recognition of their potential, the limitations of electronic surveys have often been overlooked (Croteau et al., 2010; Kiesler & Sproull, 1986). Early research on e-surveys characterized their users as "well-educated, urban, and technologically sophisticated" (Kiesler & Sproull, 1986). While this demographic profile may still apply in many cases, it prompts a more pressing question: why should such tools not be relevant and accessible to less technologically advanced groups, including rural populations? Recent scholarship has increasingly highlighted the importance of inclusivity for these communities (Patnaik et al., 2020; Petesch & Badstue, 2020). Research focused on technology integration in rural areas remains relatively limited (Kasran et al, 2023; Mantra, 2003; Tukiran, 2010), although studies on rural upskilling and welfare, particularly during the pandemic, have contributed to raising awareness and proposing strategies for improvement (Safrina et al., 2023).

One of the primary challenges faced by the community involved in this study was the continued use of manual, paper-based methods for managing village-level farming communications. This practice often resulted in incomplete or lost information. Recognizing this issue, our team identified the need to support the community by introducing digital tools. Without such intervention, delayed responses from local administrative bodies could occur, leading to miscommunication or even mishandling of critical support programs. For instance, a lack of accurate demographic data or farming records could hinder the timely distribution

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of aid such as COVID-19 relief packages or fertilizer subsidies. We therefore proposed to introduce a basic digital skill using devices already familiar to the community, such as their cell phones.

This initiative sought to address several key questions: How can rural communities be supported in becoming familiar with electronic surveys? How might district governments benefit from communities skilled in using these tools? Would such familiarity not help overcome a range of data collection challenges, including those related to population tracking, government aid, and regional planning? In an era when the public increasingly expects population and regional data to be available online and up to date, such improvements in digital competency are particularly relevant for development strategy. Nevertheless, most rural communities continue to rely on hardcopy data collection. The digitalization of rural areas in developing countries is a matter of growing concern, particularly as it relates to population data and socio-economic development (de Salvo & Pineiro, 2022; Trendov et al., 2019; FAO, 2019; OECD, 2015; Sutiyo & Maharjan, 2017).

Empowering communities with digital skills beyond basic smartphone communication can enhance productivity and increase participation in addressing local needs and improving overall welfare. This paper seeks to explore, in a modest way, how a rural community can benefit from learning to use and eventually create electronic surveys as a means of data collection.

## 2. METHOD

This community service initiative was conducted in Karangpakis Village, located in the Jombang sub-district of Jombang Regency, East Java, Indonesia (Figure 1). Thirty individuals were invited to participate in the digital applications training workshop. These participants included village officials, neighborhood and community unit representatives (*Rukun Tetangga* and *Rukun Warga*), as well as members of the Family Welfare Development program, known locally as *Pembinaan Kesejahteraan Keluarga* (PKK). The training workshop was held in the village community hall on Friday, November 28, 2022. The broader research and preparatory activities, including site visits, were carried out from June 2022 to January 2023.

Karangpakis Karangpakis Village was selected based on a request from the local administration, which expressed a need to provide basic digital skills training for the community. The purpose was to help residents become more familiar with digital data collection methods as part of a broader transition from manual population data collection using printed leaflets to a more streamlined and digital approach. In the existing practice, once data was collected, it was often not processed or analyzed immediately. This delay prompted the implementation team to support the village in improving the efficiency of data handling through digital tools.

The training was designed around the use of a basic electronic survey platform, specifically Google Forms. The session included a step-by-step guided walkthrough in which participants learned how to complete an electronic survey. Instruction was delivered through a standard classroom presentation using PowerPoint slides, accompanied by a live demonstration of the application. Participants were encouraged to use their own smartphones to practice completing the survey form in real time. The primary objective of the workshop was to identify the challenges participants faced in navigating and completing an electronic survey, and to increase their familiarity with the features available in Google Forms.

The four-hour workshop included both presentation and individual practice sessions and was attended by male and female residents of Karangpakis Village, aged between 17 and 42. Participants had completed either high school or college education and were engaged in various occupations, including farming, village administration, teaching, and homemaking. Upon completion of the training workshop,

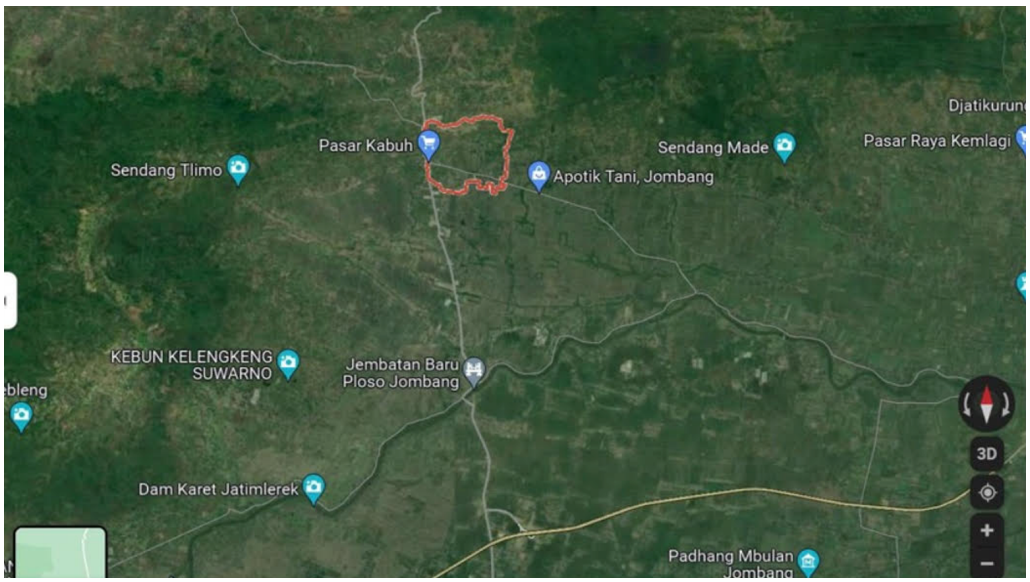


Figure 1 . The map of Karangpakis Village, Jombang, East Java

an evaluation and analysis were conducted to formulate conclusions and recommendations. The collected data was analyzed using the built-in chart features in Google Forms. Each visual representation was accompanied by an English translation provided in the description section below the original Indonesian charts.

## 3. RESULT AND DISCUSSION

The results of the workshop indicate that the introduction of electronic surveys to the Karangpakis Village community was met with a favorable response. This outcome can be categorized into three key areas: first, the accessible and participatory design of the workshop; second, the approachable and relevant use of digital technology; and third, the practical applications of the knowledge acquired, which fostered continued interest in digital tools.

To align with the objectives of community engagement, this section presents a comparison of the conditions before and after the workshop, highlighting both the community's participation and the resulting impacts. Prior to the intervention, the community had minimal exposure to structured digital training. Most participants used smartphones solely for communication or entertainment purposes and had limited awareness of their potential for data collection or administrative use. After the workshop, participants not only became familiar with electronic surveys but also began to express confidence in using digital tools for broader applications, such as neighborhood information collection and household welfare tracking. This shift represents an early stage of innovation adoption within the community.

### 3.1 Accessible workshop

The format of the workshop was designed to be informal, efficient, and engaging, making it highly accessible to participants. The group consisted of approximately 40 percent women and 60 percent men, representing a balanced demographic that contributed to active engagement (Figure 2). Throughout the session, participants were encouraged to interrupt the presentation to ask questions or demonstrate their progress while completing the survey forms on their phones. The community service team had anticipated this level of interaction and incorporated it into the facilitation strategy. Rather than being disruptive, these interactions created a supportive learning environment in which participants felt comfortable progressing at their own pace.

Time flexibility proved to be a key factor in the success of the workshop. Participants demonstrated a clear understanding of the tasks when allowed to follow the instructions using their own smartphones. A concise PowerPoint presentation with fewer than seven slides was used, complemented by multiple presenters who alternated between explaining the content and assisting participants during the hands-on practice. Although many attendees had previously heard of or briefly used Google Forms, some encountered difficulties logging in on their smartphones. These issues were traced back to phone settings and were resolved with additional guidance, allowing all participants to eventually join the exercise successfully.

Figure 2 . The participants engaged in the presentation conducted by the community service team in the village hall during the workshop

Equally important was the atmosphere of the training. Community-based workshops benefit from being practical and user-friendly, rather than overly theoretical. To set a positive tone, the session began with lighthearted icebreaking activities designed to reduce anxiety and foster rapport. While unrelated to technology, these games helped ease participants into the learning process by promoting a cheerful and collaborative mood. This approach proved effective in preparing the group for the high-paced content of the session. Once participants were more relaxed, they responded more openly to the presentation and participated with increased enthusiasm.

The step-by-step guidelines provided during the workshop were intentionally designed to be simple and easy to follow. The materials were visually clear and free of unnecessary complexity, allowing participants to absorb the instructions with confidence. By prioritizing accessibility in both design and delivery, the workshop successfully built a bridge between participants' existing familiarity with smartphones and their new understanding of digital data tools. As a result, participants left the session not only with enhanced skills but also with the motivation to apply what they had learned in their community contexts.

### 3.2 Technology helps with bringing some reality to the forefront

The technology introduced in the workshop helped surface important aspects of the community's current condition. According to the Central Bureau of Statistics, Karangpakis Village in Kabuh District, Jombang Regency, East Java, spans 5.04 square kilometers at an elevation below 500 meters. The village consists of seven sub-villages, 15 community units (RW), and 46 neighborhood units (RT). Most of the area is residential and agricultural, with rice and tobacco as key crops, indicating that farming is the main occupation.

Practicing with Google Forms offered a practical alternative for both residents and village officials to collaborate in data collection (Figure 3). It highlighted existing gaps in demographic and population records. Using digital surveys was seen as a more effective, efficient,

and paperless method that could reduce costs and speed up administrative processes.

Figure 3 . Recording the participants' backgrounds

### 3.3 Furthering participant's skills

Finally, the workshop enabled participants to expand their knowledge of digital applications through hands-on practice using their own smartphones. Prior to the training, most participants used their phones primarily for communication via limited applications such as WhatsApp or Facebook. Learning to use Google Forms introduced a new practical skill that could be applied for personal purposes or small business activities. In preparation, the team designed practice surveys on topics such as community health, drawing from lessons learned during the pandemic.

Participants also had the opportunity to view the collected responses through live survey results. This allowed them to understand how their input was processed and visualized, offering a basic introduction to data interpretation. The real-time display of responses helped participants connect their actions to outcomes, reinforcing the practical value of the skill. Although some participants were unable to submit responses due to technical issues related to phone settings, the team ensured that all participants could still observe the results through a demonstration.

In the subsequent graphical representations are the data visualized from the Google Forms practice filled out by the participants. Because the questions were stated in Indonesian, the visualization automatically carried the original Indonesian phrases. For the purpose of this paper, a translation is provided prior to each figure in the square-bracketed number, together with the accompanying legend.

Evidently, in Figure 4, participants viewed the age distribution of the group, revealing an age range of 17 to 42, with 17 percent aged between 27 and 28. In Figure 5 (a), over 80 percent of participants had received a third COVID-19 vaccine dose, while 11.8 percent had completed only two doses. Others were unable to receive vaccination due to comorbidities or advanced age. Both results drew interest from village administrative staff, who noted the potential of survey visualizations for local decision-making.

In Figure 5 (a), the survey results showed that over 80 percent of participants had received a third COVID-19 vaccine dose or booster. An additional 11.8 percent had completed only two doses, while the remainder had not been vaccinated due to comorbidities or advanced age.

Both Figure 4 and Figure 5 (a) attracted particular interest from the administrative staff of Karangpakis Village. They noted the usefulness of visualized data and expressed that such survey tools could benefit not only village governance but also individual households. These findings demonstrate the potential value of electronic surveys in improving public health monitoring and local decision-making.

In Figure 5 (b), participants observed that their responses confirmed the presence of garbage disposal facilities in their homes. The survey received a complete

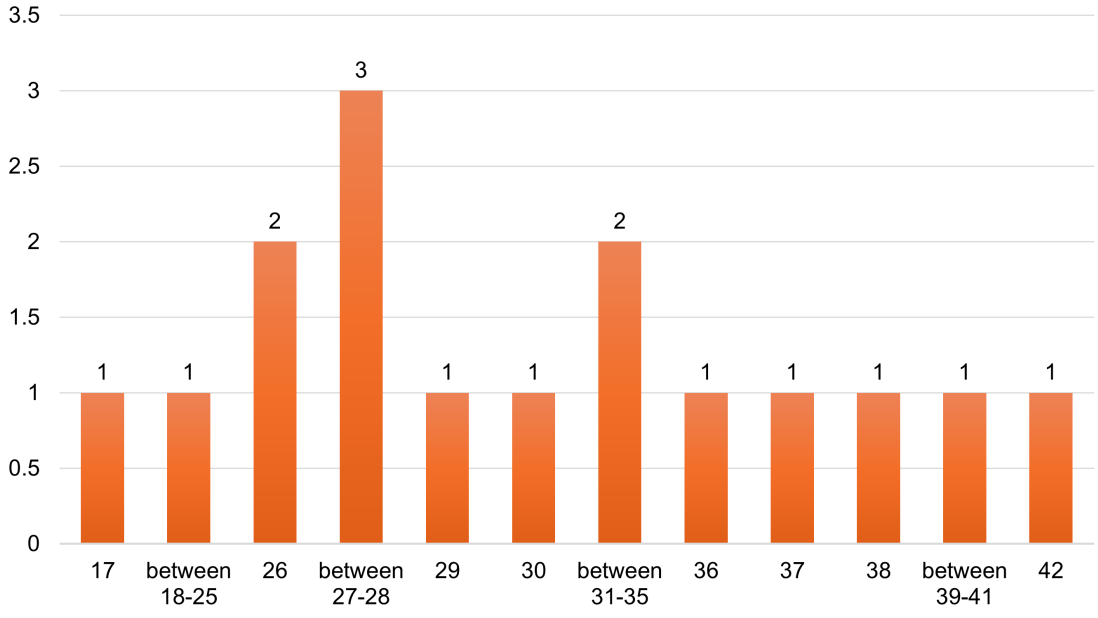


Figure 4 . Participants' age ranges

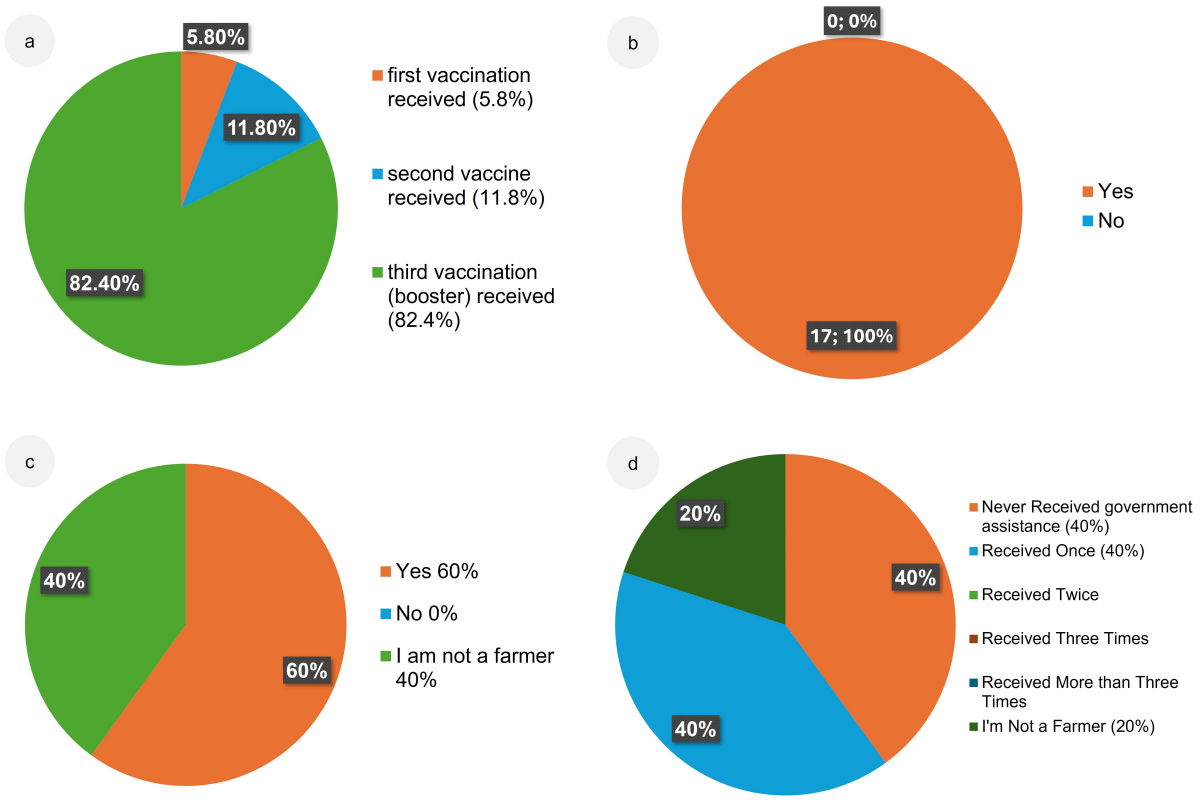


Figure 5 . (a) COVID vaccine recipients; (b) Garbage disposal in household; (c) Fertilizer assistance from the government; (d) The frequency of fertilizer assistance received by farmers

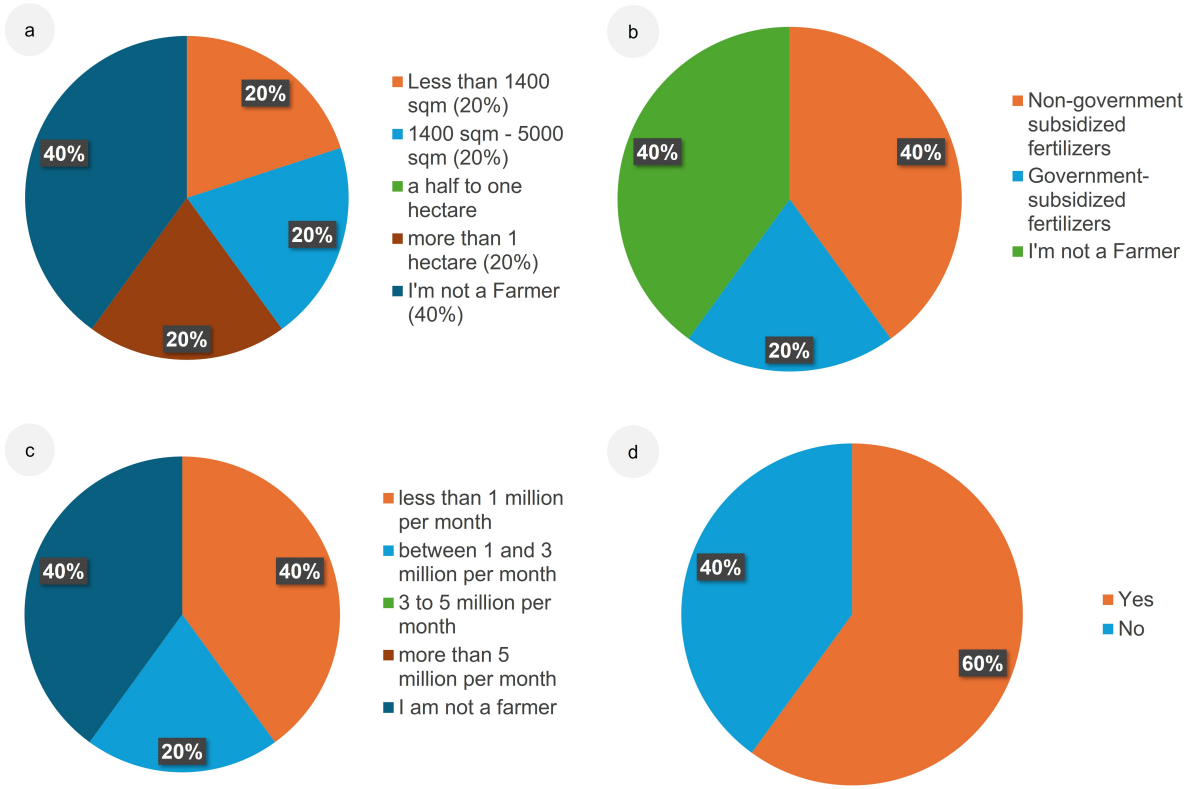


Figure 6 . (a) Farming area by $m^2$; (b) Use of fertilizers; (c) Average income by harvest per month; (d) Government funds received by non-farmers

response rate on this question, with 100 percent of participants indicating that their households had such facilities. Building on this, the team designed additional sample practices using Google Forms to gather useful data that could inform village-level administrative decisions, particularly regarding government assistance.

In Figure 5 (c), participants reviewed a question related to fertilizer aid during the pandemic. The results showed that 60 percent of respondents had received government assistance, while the remaining 40 percent reported that they were not farmers and therefore were not eligible.

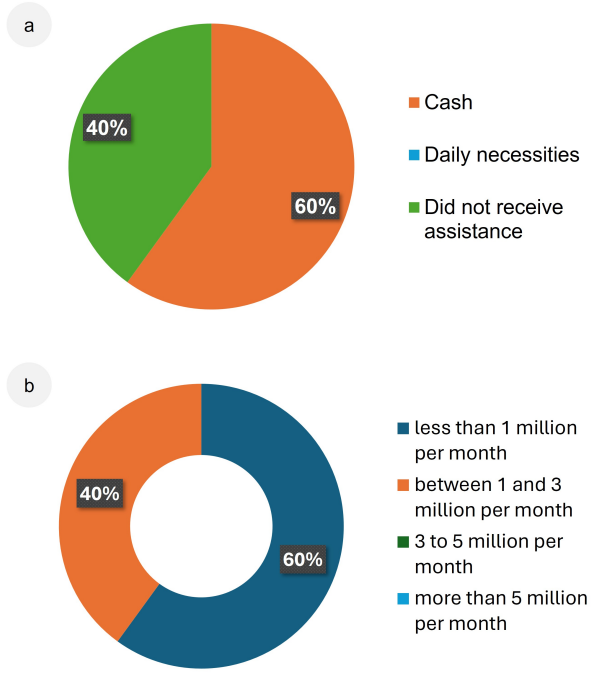


Figure 7 . (a) The type of funds for non-farmers; (b) The average income of non-farmers per month

In Figure 5 (d), the survey examined the frequency of fertilizer assistance among recipients. The results revealed that 40 percent of participants received aid once, another 40 percent received none, and 20 percent identified as non-farmers. These findings underscore the importance of timely and accurate data in addressing critical issues such as the distribution of agricultural support and highlight the need for better tracking to meet community needs.

Fertilizer assistance has played a vital role for farmers across Indonesia, with urea and nitrogen-phosphorus-potassium (NPK) being the main types distributed. However, distribution challenges remain, especially in remote villages, requiring some communities to develop their own solutions (Azmi, 2023). While the workshop did not directly address these broader issues, the ability to visualize the number of aid recipients provided insight into potential gaps in distribution.

Regarding participants' occupational backgrounds, the survey revealed that not all respondents were farmers. In Figure 6 (a), (b), and (c), the data highlighted the need to expand electronic survey questions to include non-farming residents. Although the training focused on a preliminary introduction to survey tools, these findings still offered valuable baseline information.

In Figure 6 (a), 60 percent of respondents identified as farmers. Of these, 20 percent reported cultivating land between 1,400 and 5,000 square meters, while another 20 percent farmed plots larger than one hectare. Figure 6 (a) also indicated that 40 percent of respondents were non-farmers.

In Figure 6 (b), data showed how farmers acquired fertilizer. Only 20 percent used government-subsidized fertilizer, while 40 percent relied on privately sourced, non-subsidized fertilizer. The remaining 40 percent were non-farmers, reinforcing the need for more inclusive survey items.

In Figure 6 (c), participants reported their average monthly income from harvests. Figure 6 (c) showed that 20 percent earned between one and three million rupiah per month, while 40 percent earned below one million. Again, as shown in Figure 6 (a), 40 percent of respondents were identified as non-farmers, suggesting that economic data collection should also account for other types of livelihoods.

Equally important, non-farming participants were shown how their information contributed to the overall profile of the village. This group included teachers, government officials, small business owners, and homemakers. For example, non-farmers were asked whether they had received any government funds or subsidies during the COVID-19 pandemic (Figure 6 (d)), the type of funds received (Figure 7 (a)), and their average monthly income (Figure 7 (b)).

These illustrations underscored that non-farming residents also play a significant role in the fabric of the village community. Regardless of occupation, all members are eligible for certain forms of assistance. In Figure 6 (d), 60 percent of non-farmers reported receiving government assistance, while 40 percent did not. When asked about the type of assistance, 60 percent stated they received cash aid, and 40 percent reported receiving none (Figure 7 (a)). In Figure 7 (b), 60 percent of participants earned less than one million rupiah per month, while 40 percent earned between one and three million rupiahs.

The overall findings demonstrate that a simple training workshop can reveal more than just data-collection skills. Through direct interaction, the team was able to identify community needs, challenges, and opportunities for capacity building and technology reskilling (Halseth et al., 2019; Pal et al., 2021).

The implications of the activity and subsequent analysis highlight several issues for further consideration.

1. The data presented in the illustrations may not fully reflect actual community conditions. Since the workshop was brief and the survey examples were designed for practice, they should not be treated as official records. Future surveys should include targeted questions aligned with the intended purpose, allowing village officials to generate accurate data. Such an approach could improve community

productivity, particularly in the distribution of government assistance such as fertilizers, which are critical to the farming sector (Azmi, 2023).

2. The number of responses in each illustration varied, with some questions receiving as few as five and others up to seventeen responses. This incomplete dataset is not representative of the broader community. As the first activity of its kind in this village, the workshop served primarily to familiarize participants with electronic surveys. Future initiatives should expand participation to better assess digital skill needs, supporting the development and integration of rural information systems (Kasran et al, 2023) and contributing to broader demographic understanding (Trendov et al., 2019; FAO, 2019).
3. Not all participants completed the survey due to unresolved technical issues with their smartphones. Some chose to observe rather than participate, even when encouraged. This highlights the need to ensure participants are both technically prepared and comfortable with the activities. It also emphasizes the importance of designing workshops that motivate full engagement. Although icebreaking activities were included, they did not guarantee complete participation, which should be considered in planning future sessions.
4. The workshop also offered insight into social dynamics in the community. Notably, digital interaction appeared to challenge traditional gender norms. While male participants slightly outnumbered females, the majority of recorded responses came from women. This suggests that female participants were able to overcome initial barriers in smartphone use and complete the training tasks successfully. These observations align with previous research on gender interaction in technology, showing how digital engagement can influence perceptions of gender roles (Petesch & Badstue, 2020; Safrina et al., 2023). Understanding such dynamics is important for identifying how digital skills can strengthen the capacities of both men and women in rural settings, providing a strong basis for future research on gender roles and digital competence in village communities.

## 4. CONCLUSION

This study demonstrates that acquiring basic digital knowledge is essential for both men and women in rural households of East Java. Such skills can accelerate the collection of rural information through electronic forms and enable district-level governance to organize fact-finding processes more efficiently. The findings highlight three key areas where the community service activity presented both challenges and opportunities for improvement: the delivery of an accessible workshop, the importance of introducing technology to the community, and the enhancement of participants' skills through exposure to the practical results of digital applications.

Digital literacy not only equips community members with the capacity needed in the current technological era but also encourages them to support and participate in collective learning and upskilling initiatives. Future research on digital skill development could expand into other areas of community productivity, including small and medium enterprises (SMEs), maternal and child healthcare programs, and local sustainable tourism initiatives.

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## CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest in relation to this community service program.

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