Increasing Farmer Groups Capacity in Cempaka District through the Utilization of Mobile-Based Knowledge Management and Strengthening Digital Literacy

PACU PUTRA[1], NABILA RIZKY OKTADINI[2], IRMAWATI[3], ALLSELA MEIRIZA[4], PUTRI EKA SEVTIYUNI[5]

[1,2,4,5] Department of Information System, Universitas Sriwijaya
[3] Department of Agricultural Cultivation, Universitas Sriwijaya
Email: pacuputra@unsri.ac.id

ABSTRACT

Kelompok Tani (Poktan) Hidup Baru is located in Cempaka District, East Ogan Komering Ulu (OKU) Regency, 123 km away from Sriwijaya University. Poktan Hidup Baru was established in 2020 by farmers in Cempaka District and is led by Ali Fauzan. With 29 members, most of them are rice and fruit farmers. The limited technology and literacy of the farmers means that they are not able to innovate. Therefore, the main problem in the Community Partnership Empowerment Programme is the lack of digital literacy and agricultural knowledge management skills. Therefore, this PKM programme aims to introduce knowledge management and improve farmers' skills in using the internet and mobile-based agricultural applications. In addition, this PKM programme also aims to support the transformation of higher education through the production of scientific publications and audio-visual works. Service activities are carried out in five stages: first, preparation; second, production of materials; third, advice; fourth, support; and fifth, monitoring. The team provides advice and training on the culture of knowledge sharing and the use of agricultural applications such as Plantix. This application can help solve agricultural problems in identifying pests and plant diseases, irrigation and marketing agricultural products. The positive response from the Hidup Baru farmer group indicates the need for similar training in the future to improve farmers' knowledge and skills.

Keywords: *Kelompok Tani, Knowledge Sharing, Desa Cempaka, Digital Literacy, Plantix*

1. INTRODUCTION

The Hidup Baru Farmer Group (Poktan) is a farmer group in Cempaka District, East Ogan Komering Ulu (OKU) Regency which is 123KM from Sriwijaya University with a travel time of around 2 hours 31 minutes by motorized vehicle. The Hidup Baru Farmer Group is a target partner in this Community Partnership Empowerment (PKM) activity which is directed at social

aspects of society, especially in improving skills and improving management capabilities, especially knowledge management from human resources in the Hidup Baru Farmer Group.

The Hidup Baru Farmers Group was established in 2020 from farmers in Cempaka District, East OKU Regency, chaired by Mr. Ali Fauzan. At the beginning of its establishment, the Hidup Baru Farmers Group had 29 members. The majority of farmers who are members of the Hidup Baru Farmers Group are rice farmers and fruit farmers. Innovation and utilization of technology to increase agricultural production are still very lacking. Apart from the fact that Cempaka District is the outermost district in East OKU Regency so that it is far from the reach of the district capital government, this is also due to the lack of farmer literacy. The majority of farmers in the Hidup Baru Farmers Group do not receive formal education in agriculture, so the exchange of information and knowledge between farmers is only carried out based on hereditary habits. The agricultural cultivation carried out is limited to rice and fruit plants inherited from ancestors from generation to generation.

Digital literacy is the ability to use digital technology, especially to access, evaluate and produce information using digital devices **(Hussain & Phulpoto, 2024)**. Digital literacy has many benefits for different sectors, including education **(Chan, 2024)**, banking **(Finger et al., 2024),** healthcare **(Ji et al., 2024),** industry **(Kadhim, 2024),** and agriculture **(Junudu et al., 2020)**. In terms of improving digital literacy, knowledge sharing is a behaviour that can stimulate people's interest in improving their digital literacy skills **(Jasin et al., 2024).**

Although currently technological developments are increasing and information is easily obtained, this has not changed the way farmers innovate by utilizing technology to increase agricultural production or for agricultural diversification. As in a survey conducted on farmers in Serang Regency where based on the survey results, farmers only carried out digital literacy less than 3 times and the average duration was 30 minutes in the last 2 weeks **(Nuryadi et al., 2023)**. This causes a lack of knowledge to innovate owned by farmers. In fact, based on a survey conducted at the Poktan Hidup Baru partner location, it is very possible to make efforts to increase agricultural production starting with increasing digital literacy and knowledge management so that farmers are equipped with sufficient and competent skills in accessing information and managing knowledge. Moreover, the majority of farmers have access to gadgets and internet access, but massive efforts are needed to be able to maximize the use of gadgets in agriculture.

Increasing the capacity of farmers in accessing information and managing knowledge among them is a turning point that must be achieved in order to create more innovative and productive agricultural resources. This is like the activities that were once carried out in the Farmer Group in Pinangan Village, Central Aceh Regency **(Prayetno et al., 2024)**. From the results of these activities, farmers got an idea of modern farmers where farmers can utilize digital technology in accessing information related to agriculture, for example information on market prices, increasing the added value of their agricultural products, and increasing efficiency in managing their agricultural businesses. Similar to the digital literacy training activities carried out on coffee farmers in Gapoktan Mekar Tani, Jambuwer Village, Kromengan District, Malang Regency, this activity has increased the knowledge of coffee farmers in product marketing (digital marketing) **(Haris et al., 2022).** Digital literacy training activities can also increase agricultural productivity as carried out on Pineapple farmers in Tangkit Baru Village, Sungai Gelam District, Muaro Jambi Regency **(Junudu et al., 2020; Wediawati et al., 2023)**. From this, it can actually be said that there are many things that can be produced from digital literacy activities, including the use of digital technology to obtain important information, increase the added value of products, increase the efficiency of managing agriculture, increase product marketing, and increase agricultural productivity. This should be utilized by farmers in

Poktan Hidup Baru, it's just that farmers in Poktan Hidup Baru do not know how to access digital literacy. This is due to the lack of digital literacy skills that they have, so that farmers only obtain knowledge that comes from farmers themselves, which causes their agriculture to still lack innovation.

2. METHOD

The method used in this community service activity is empowering active participation through knowledge transfer in digital literacy and knowledge management. The five stages of community service implementation that will be carried out in this activity are (1) Preparation (2) Drafting Counseling and Training Materials (3) Counseling (4) Mentoring (5) Monitoring and Evaluation

2.1 Preparation
Preparation carried out to observe and survey the partners who will be the object of the activity. At this stage the proposing team conducted an interview with the head of the Poktan Hidup Baru, Mr. Ali Fauzan. From the results of the interview the team got several problems faced by Poktan Hidup Baru. then continued with a discussion to select the main problems that could be given solutions based on the expertise of the committee. Then the committee confirmed the activities to be carried out and the selection of locations for community service activities.

2.2 Drafting Counseling and Training Materials
Drafting Counseling and Training Materials, at this stage the proposing team prepares materials that will be delivered in counseling and training activities. The materials prepared by the proposing team include material about digital literacy, material about knowledge management, how to operate applications for farmers based on knowledge management.

2.3 Counseling
At this stage, the proposing team and students together with members of the Hidup Baru Farmer Group conducted counseling and training in Cempaka Village, Cempaka Village, Cempaka District, East Ogan Komering Ulu (OKU) Regency. This activity consists of several activities, including the delivery of material on digital literacy, delivery of knowledge management material, material on increasing agricultural productivity. Before starting this activity, training participants were given a Pre-Test Questionnaire to measure how much they understood about the material before starting the training.

2.4 Training and Mentoring
At this stage, the proposing team practiced how to search for digital information about agriculture through devices. Then, they invited several farmers to try directly in finding several examples of cases of finding information about agriculture. Then the proposing team also demonstrated the use of knowledge-based mobile applications to share information, search for information both tacit and explicit information. At the end of the activity session, counseling participants were given a Post-Test to measure the level of understanding of the material that had been provided both in counseling, training and mentoring.

2.4 Monitoring and Evaluation
At this stage, the proposing team monitors and evaluates the activities that have been carried out with the Poktan Hidup Baru in Cempaka Village, Cempaka Village, Cempaka District, East Ogan Komering Ulu (OKU) Regency. The things that need to be monitored in this activity including:

a. Suitability of Program Implementation with the plan
b. Achievement of the Community Service activity program
c. Impact of Community Service activities
d. And also evaluation in the form of feedback from training participants for improvement, improvement for the next activity, especially for the proposing team.

Methods to overcome the problem of lack of Digital Literacy
The proposing team will conduct hands-on practice on how to use devices to find information (digital literacy) on farming techniques, pests in plants, agricultural technology. The proposing team will challenge some farmers to find information about crystal guava farming techniques through the devices they have or if there are none, through the devices of the proposing team. Then, participants will be asked to explain the information on how to farm crystal guava. Then, other participants are asked to tell what is the difference with what they have done so far, participants are asked to explain new things that can be learned from the results of digital literacy.

Methods to overcome the problem of Knowledge Sharing
The proposing team will explain the importance of knowledge and the culture of knowledge sharing. The team will ask randomly about what knowledge they think others do not know. Participants are asked to explain about the knowledge, then the next participant explains whether they know the knowledge or not. Then the participant who commented on whether they knew the knowledge was asked to explain another piece of knowledge that he or she had that others might not know about, and so on. While the farmers were explaining the knowledge, the students took notes and summarized the knowledge explained by the farmers, and then the students would put the knowledge in the knowledge management-based application. Then, the proposing team asked some farmers to try to practice how to find information about the things that had been explained previously. Then the participants were asked to comment on the concept of knowledge sharing whether it was as difficult as previously imagined or not.

3. RESULT AND DISSCUSSION

Firstly, the proposing team confirmed the activities to be carried out and the selection of locations for community service activities as seen in figure 1. The preparation stage was carried out from March 2024 to June 2024.The proposing team then prepared materials to be delivered in counseling and training activities. The materials prepared by the proposing team include material on digital literacy, material on knowledge management, how to operate applications for farmers based on knowledge management.

Figure 1. Discussion between farmer and commitee

The proposing team and students together with members of Hidup Baru Farmer Group conducted counseling and training in Cempaka Village, Cempaka Village, Cempaka District, East Ogan Komering Ulu (OKU) Regency as seen in figure 2. This activity consists of several activities, including the delivery of material on digital literacy, delivery of knowledge management material, material on increasing agricultural productivity. Before starting this activity, the training participants were given a Pre-Test Questionnaire to measure how much they understand about the material before starting the training.

Figure 2. Counseling and Training

In the mentoring stage (figure 3), farmers and the community service team go to the field. This activity was carried out on the second day of training. The location of the assistance is the plantation of farmer representatives from the Hidup Baru Farmer Group. In the field, the community service team gave souvenirs in the form of agricultural tools. In addition to handing over agricultural tools, the farmers immediately tried to use the sprayer given by the community service team as seen in figure 4.

Figure 3. Mentoring Stage

Figure 4. Agricultural Stuff

The community service team listened to stories of farming experiences and also sessions of stories of problems faced during farming. In addition to listening, the service team also provided input on how to apply technology to be a solution to the problems faced by farmers. From the results of discussions with farmers, there are several problems they face, including irrigation problems, problems with pests and plant diseases, and problems selling crops. From the results of counseling on the first day, the solution to the problem of pests and plant diseases can be reduced by digital literacy and sharing knowledge about the problem of pests and plant diseases. For irrigation problems, the community service team told about smart irrigation, where by utilizing technology farmers can do watering without having to depend on the weather as seen in figure 5. However, due to the lack of resources, the farmers hope that there will be follow-up activities from community service for next year. The farmers expect training on the application of smart irrigation so that they are not dependent on the weather.

Figure 5. Mobile Based Knowledge Sharing

In the counseling and training activities, the community service team as a training resource person delivered several materials including the culture of sharing knowledge and the use of technology in recognizing problems in agriculture. One of the applications introduced in the training was an application called plantix. This application is based on artificial intelligence which can help detect plant diseases, besides being able to detect this application can provide solutions for what farmers can do in dealing with plant diseases. In addition to the artificial intelligence feature, the plantix application was chosen because it also has a feature to share knowledge through the community feature as seen in figure 6 and 7. Farmers are also given material about the culture of sharing knowledge and also the use of technology in finding solutions to problems of pests and plant diseases. This means that there is a connection between the material and the problems faced by farmers, especially problem number one.

Figure 6. Mobile Based Knowledge Sharing

Figure 7. Mobile Based Community Knowledge Sharing

One of the materials presented by the resource person was about a pest called whitefly. Farmers have been dealing with this pest, but they are still confused about what is the best solution to eliminate this whitefly pest. The resource person and the farmer shared the solution to this pest, which turned out to be very simple: trapping whitefly-producing flies with yellow traps by painting a bottle yellow and then applying glue to it. The informant said that the solution was not just a solution, and pointed to an article from an international study that provided the solution. This shows that farmers' knowledge and experience can already be shared with others, and farmers should also be able to find information related to other plant pests and diseases through digital literacy as seen in figure 8.

Figure 8. An Example of Using Mobile Based Knowledge Sharing to Solve Pest Problem

This community service activity is very interesting for farmers, because based on remarks by the head of the Hidup Baru farmer group, he said that this was the first time the group had been involved in a training event like this. The enthusiasm of the participants can be seen from the number of farmers who came, namely from a total of 29 members of the Hidup Baru farmer group, who came to this community service activity amounted to 29 people, even some people invited their friends from neighboring village farmer groups as seen in figure 9.
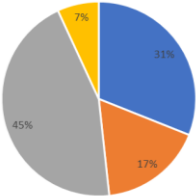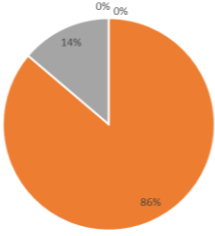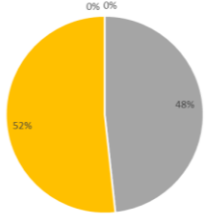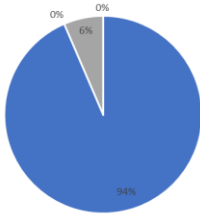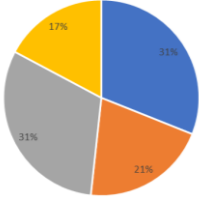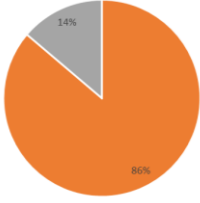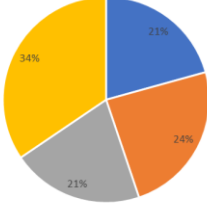

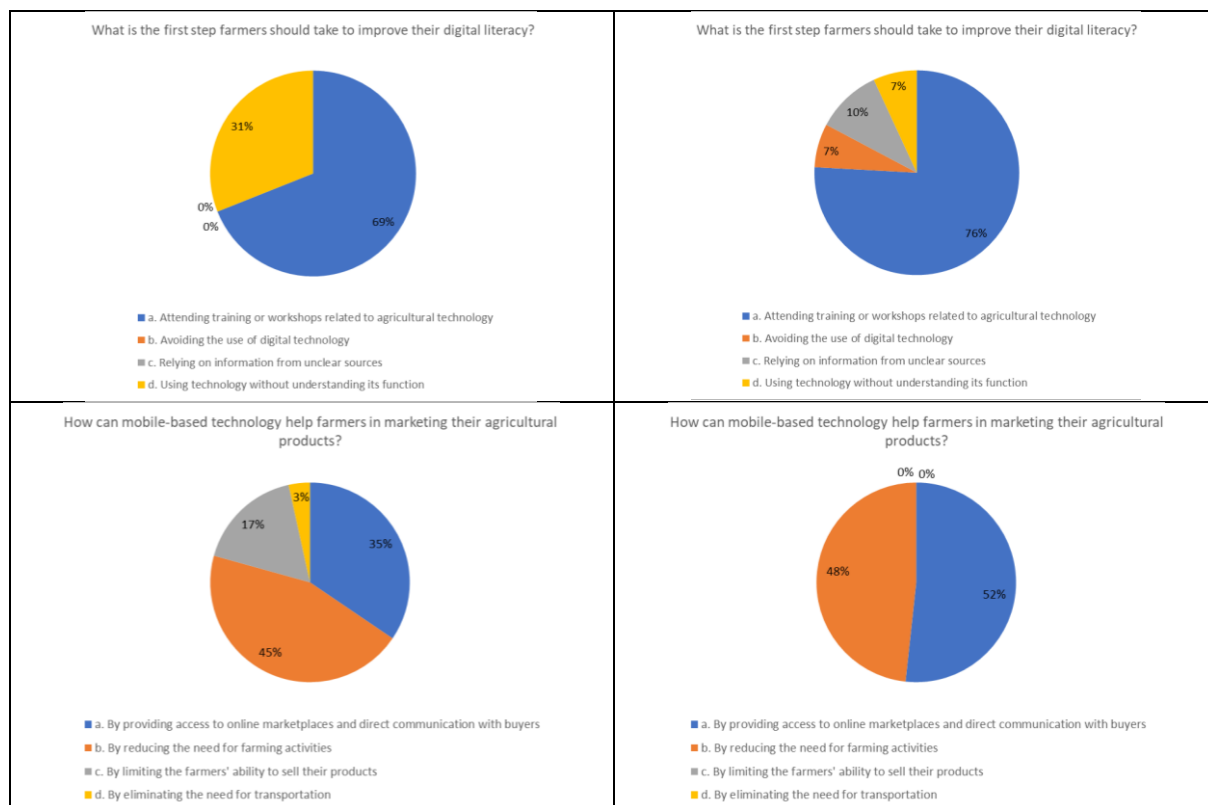**Figure 9. the audience interact to student (counseling)**

After the community service activity ended, the community service team assisted by students collected testimonial data (Post-Test) related to this community service activity. The comparison of pretest and post-test shows in table 1.

Table 1. the comparison result Pre-test and Post-Test

Pre-test Result	Post-Test Result
What is meant by Knowledge Management in the agricultural context?	What is meant by Knowledge Management in the agricultural context?
What is the main benefit of mobile applications in agriculture?	What is the main benefit of mobile applications in agriculture?
What is meant by digital literacy?	What is meant by digital literacy?
What are the positive impacts of strengthening digital literacy for farmers?	What are the positive impacts of strengthening digital literacy for farmers?

What is the main challenge faced by farmers in adopting digital-based technology?

(Chart 1)
- 7%
- 0%
- 7%
- 86%

- a. Lack of interest in agricultural innovation
- b. Limited access to the internet and technology devices
- c. No challenges at all
- d. Only the government plays a role in technology adoption

What is the main challenge faced by farmers in adopting digital-based technology?

(Chart 2)
- 0%
- 0%
- 7%
- 93%

- a. Lack of interest in agricultural innovation
- b. Limited access to the internet and technology devices
- c. No challenges at all
- d. Only the government plays a role in technology adoption

How can Knowledge Management improve farmers' productivity?

(Chart 3)
- 34%
- 7%
- 7%
- 52%

- a. By sharing information and best practices among farmers
- b. By eliminating traditional farming methods
- c. By restricting farmers' access to new information
- d. By reducing the number of farmers working

How can Knowledge Management improve farmers' productivity?

(Chart 4)
- 0%
- 0%
- 7%
- 93%

- a. By sharing information and best practices among farmers
- b. By eliminating traditional farming methods
- c. By restricting farmers' access to new information
- d. By reducing the number of farmers working

What is the main advantage of mobile applications in farm management?

(Chart 5)
- 0%
- 4%
- 17%
- 79%

- a. Providing quick access to agricultural information, market prices, and weather conditions
- b. Completely replacing labor in agricultural fields
- c. Used only for gaming and entertainment
- d. No significant benefits

What is the main advantage of mobile applications in farm management?

(Chart 6)
- 0%
- 0%
- 21%
- 79%

- a. Providing quick access to agricultural information, market prices, and weather conditions
- b. Completely replacing labor in agricultural fields
- c. Used only for gaming and entertainment
- d. No significant benefits

Which of the following is an example of a digital application that can help farmers manage their farms?

(Chart 7)
- 52%
- 48%

- a. YouTube
- b. Facebook
- c. Plantix
- d. Spotify

Which of the following is an example of a digital application that can help farmers manage their farms?

(Chart 8)
- 14%
- 0%
- 0%
- 86%

- a. YouTube
- b. Facebook
- c. Plantix
- d. Spotify

Comparing these graphs, it can be seen that before the training the participants did not understand what digital literacy is, how to use technology to share knowledge and also how to use applications that can help farmers to help participants in agriculture. After the training, the post-test results show that most of the participants understood the concept of using technology for digital literacy, knowledge sharing and how to use one of the applications that can help in the world of agriculture, called Plantix.

4. CONCLUSIONS

Community service activities with the title Utilization of Knowledge Management and Strengthening Digital Literacy as an Effort to Increase Farmer Capacity for Farmer Groups in Cempaka District, OKU Timur have been successfully implemented. This activity involved several lecturers from the Faculty of Computer Science and the Faculty of Agriculture, Sriwijaya University. In addition, this activity involved students who also came from these faculties.
Based on the number of participants present, it can be seen that the Hidup Baru Farmer Group is very interested in training activities like this. The Farmers Group hopes that training activities like this will continue in the following year in order to increase farmers' knowledge by using technology.

In the future, the partners can still apply technology to support the independence of the Hidup Baru farmer group. If possible, similar activities will be held such as institutional strengthening programs and to increase farmers' knowledge and skills in other fields such as digital-based post-harvest marketing (e-marketing).

ACKNOWLEDGEMENT

LIST OF REFERENCES

Chan, G. H. (2024). Enhancing digital literacy in education: educational directions. *Education+ Training*, *66*(1), 127–142.

Finger, M., Manos, R., & Shakir, O. (2024). Power relationships, digital literacy, and inclusive digital banking in Israel. *Finance Research Letters*, *63*, 105292.

Haris, M. S., Kusuma, W. T., & Anshori, M. (2022). Peningkatan Literasi Teknologi Pemasaran Digital Petani Kopi Gapoktan Mekar Tani Desa Jambuwer Kecamatan Kromengan Kabupaten Malang. *Jurnal Pengabdian Masyarakat Bhinneka*, *1*(2).

Hussain, N., & Phulpoto, S. (2024). Digital Literacy: Empowering Individuals in the Digital Age. *Assyfa Learning Journal*, *2*(2), 70–83.

Jasin, M., Anisah, H., Fatimah, C., Azra, F., Suzanawaty, L., & Junaedi, I. (2024). The role of digital literacy and knowledge management on process innovation in SMEs. *International Journal of Data and Network Science*, *8*(1), 337–344.

Ji, H., Dong, J., Pan, W., & Yu, Y. (2024). Associations between digital literacy, health literacy, and digital health behaviors among rural residents: evidence from Zhejiang, China. *International Journal for Equity in Health*, *23*(1), 68.

Junudu, A., Rum, M., & Dastina, W. (2020). Literasi Informasi Petani Nanas dalam Meningkatkan Produktivitas Pertanian di Desa Tangkit Baru Kec. Sungai Gelam Kab. Muaro Jambi. *Nazharat: Jurnal Kebudayaan*, *26*(01), 173–206.

Kadhim, M. J. (2024). Digital Literacy and Its Importance in the Modern Workforce. *International Journal of Social Trends*, *2*(2), 44–50.

Nuryadi, B. A., Saleh, K., & Salampesi, Y. L. (2023). PENGARUH INFORMASI DIGITAL TERHADAP KINERJA PENYULUH PERTANIAN DENGAN LITERASI INFORMASI SEBAGAI VARIABEL INTERVENING. *Jurnal Penyuluhan dan Pemberdayaan Masyarakat*, *2*(3), 28–40.

Prayetno, B. E., Lestaria, E., Sarinauli, B., Abidin, Z., & Yanti, S. (2024). Peningkatan Literasi Digital di Kalangan Kelompok Tani di Kampung Pinangan Kabupaten Aceh Tengah. *Jurnal Masyarakat Indonesia (Jumas)*, *3*(01), 28–33.

Wediawati, B., Setiawati, R., Amin, S., Widiastuti, F., & Ratnawati, R. T. S. (2023). Pelatihan Pengelolaan Media Sosial Dalam Meningkatkan Pemasaran Online Olahan Produk Nanas Pada Usaha Mikro Desa Tangkit Baru. *Jurnal Inovasi, Teknologi dan Dharma Bagi Masyarakat*, *5*(3), 66–72.