FARMER PARTICIPATION IN AGRICULTURAL TRAINING DURING THE COVID-19 PANDEMIC: INSIGHTS FROM THE FARMER-SCIENTISTS TRAINING PROGRAM IN LUZON, PHILIPPINES

Byron Amadeus G. Cayabyab[1*] Maria Ana T. Quimbo[2], Evelie P. Serrano[2], and Filma C. Calalo[1]
[1]Agricultural Systems Institute, College of Agriculture and Food Science, University of the Philippines Los Baños, College, Laguna, 4031 Philippines
[2]Institute for Governance and Rural Development, College of Public Affairs and Development, University of the Philippines Los Baños, College, Laguna, 4031 Philippines
*Corresponding author: bgcayabyab@up.edu.ph

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ABSTRACT

The COVID-19 pandemic disrupted agricultural training and extension services essential for sustained farmer development. This study used a qualitative multiple case design, guided by Park's Adult Dropout Model and Self-Determination Theory, to examine two Farmer-Scientists Training Program cases in Luzon, Philippines, with contrasting completion rates and identify factors influencing participation and training completion. Data were collected from all 43 farmer-participants using semi-structured interviews, focus group discussions, key informant interviews with implementers, and relevant documents, with face-to-face sessions conducted consecutively from May to July 2023. The intrinsic motivation, particularly the desire to gain knowledge and improve farm productivity, was the primary driver of participation, supported by extrinsic motivation, such as recognition as "Farmer Scientists" and incentives. However, sustaining training participation and completion depended on the interplay of external factors, including pandemic-related restrictions, abiotic stresses, and health concerns, which interacted with internal factors such as training design limitations and reduced trainer interaction, undermining participants' sense of competence, autonomy, and relatedness. Conversely, family and organizational support, strong peer relationships, and adaptive program modifications promoted social and academic integration, enabling continued engagement. The study highlights the need for flexible, context-responsive agricultural training that strengthens social support and employs adaptable delivery strategies.

Key words: motivation, training completion, psychological needs

INTRODUCTION

Agriculture was among the several industries severely disrupted by the COVID-19 pandemic, which was declared a worldwide health emergency in the first quarter of 2020. Lockdowns and mobility restrictions disrupted supply chains, threatened food security, reduced labor availability, and constrained agricultural extension and advisory services (Delos Reyes and Padrid 2024; World Bank 2020). In the Philippines, Proclamation No. 922, which declared a state of public health emergency nationwide, was issued on March 8, 2020 (Republic of the Philippines 2020). A nationwide lockdown imposed on March 15, 2020, further limited mobility, prompting immediate government interventions such as the provision of farm inputs, essential services, and measures to secure food supplies while

enforcing health protocols (World Bank 2020). From 2020 to 2023, recovery efforts were pursued in line with Republic Act No. 8435, or the Agriculture and Fisheries Modernization Act (AFMA) of 1997, with training and education programs serving as a key strategy. Although initially suspended due to health restrictions, training activities eventually resumed, underscoring their vital role in agricultural recovery and long-term development. The Department of Agriculture's Agricultural Training Institute (DA-ATI), the country's lead provider of training and extension services, sustained program implementation in partnership with government agencies, Local Government Units (LGUs), and State Universities and Colleges (SUCs) (Baconguis 2022).

While previous studies have documented the broader impacts of the pandemic on agriculture, limited attention has been given to how training programs adapt during crises and, more importantly, to the factors that influence training completion. Previous research on the Farmer-Scientists Training Program (FSTP) in the Philippines during the COVID-19 pandemic by Cayabyab et al. (2024) showed that, despite the pandemic, training participants remained satisfied with the training content, resulting in improved technical competencies and farm productivity, while emphasizing the need for institutional and logistical support post-training to sustain training effectiveness. However, limited information exists on how such programs were implemented and sustained under mobility restrictions and public health protocols. Thus, this study examined the implementation of agricultural training programs during the COVID-19 pandemic within the context of the Farmer-Scientists Training Program, analyzed factors associated with training completion, and identified strategies to strengthen training delivery beyond the pandemic.

CONCEPTUAL FRAMEWORK

The study adopted the *Adult Dropout Model* (ADM) (Park 2007), which was modified and contextualized (Fig. 1) using findings from related empirical studies on farmers' participation and attrition (Akinmusola et al. 2016; Azumah et al. 2022; Bahtera et al. 2016; Baynes et al. 2011) and guided by the *Self-Determination Theory* (SDT) (Ryan and Deci 2000).

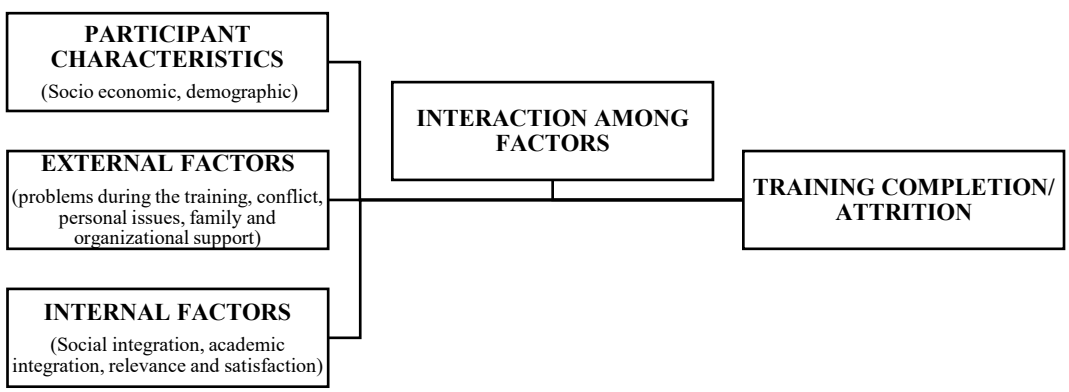

Figure 1. A conceptual framework showing the different factors influencing training completion/attrition.

The ADM is derived from the *Composite Persistence Model*, which was developed to explain learners' perseverance in distance education settings (Rovai 2003). Rovai's model, in turn, integrates key elements from *Student Attrition Model* (Bean and Metzner 1985) and the *Student Integration Model* (Tinto 1993), both of which were originally designed to explain student retention in formal education contexts.

According to the ADM, an individual's decision to complete training is influenced by three main factors: participant characteristics (socioeconomic and demographic), and external and internal factors. Empirical evidence suggests that participant characteristics alone exert only a limited or indirect influence on training attrition or completion but become significant when combined with other factors (Park 2007). The three factors are not mutually exclusive; rather, they are interconnected, and their interaction may lead to either training attrition or completion (Park and Choi 2009).

External factors refer to environmental elements outside the training program that may influence participant's decision-making regarding training completion. Identified factors include *scheduling conflicts, financial constraints, family and organizational support, personal issues, and other external challenges* beyond the control of both participants and trainers (Park 2007).

Internal factors encompass elements within the training program that directly affect participant's motivation, such as *social integration*, which is defined as the relationship between participants, their peers, and trainers, and *academic integration,* which includes aspects of training design such as mode of delivery, accessibility of training sites, and training duration (Tinto 1993). These also involve the *perceived relevance and satisfaction* derived from the program (Park and Choi 2009).

To further understand motivation and its relationship with training completion, this study draws on the *Self-Determination Theory (SDT)*, which divides motivation into intrinsic and extrinsic forms (Ryan and Deci 2000). Intrinsic motivation refers to behaviors driven by personal interest and the inherent satisfaction, fulfillment, or joy derived from the activity itself, while extrinsic motivation refers to acts motivated by external factors such as rewards, avoidance of punishment, or social pressure. SDT posits that maintaining motivation requires supporting three basic psychological needs: autonomy, competence, and relatedness. By applying this framework, the study aims to identify specific factors that may contribute to higher training completion rates and offers insights for strengthening agricultural training programs beyond the COVID-19 pandemic.

MATERIALS AND METHODS

The study employed a multiple qualitative case study approach focusing on two municipalities in Luzon, Philippines. Luzon was selected because it hosts several established sites of the Farmer-Scientists Training Program (FSTP) and experienced varying completion rates during the COVID-19 pandemic (2020 to 2022), making it an appropriate setting to examine factors influencing program participation and completion. Two municipalities were purposively selected, one with a low completion rate and another with a high completion rate, to identify key factors affecting training outcomes.

The multiple case study design allowed for an in-depth investigation of the phenomenon using a variety of data sources, in line with Creswell (2014). Credibility and validity were ensured through personal interviews, focus group discussions (FGDs), and key informant interviews (KIIs) (Creswell and Miller 2000), complemented by secondary data from the Agricultural Training Institute Regional Training Center (ATI-RTC) and the University of the Philippines Los Baños (UPLB).

Before data collection, the study protocol underwent an ethics review process through the UPLB Research Ethics Board. A complete enumeration of 43 farmer-participants from both municipalities was conducted due to the relatively small population. For the FGDs, at least six farmers from each municipality participated to enrich the data and allow sufficient time for sharing. KIIs were conducted with one representative each from the ATI-RTC, UPLB, and the Local Government Unit (LGU) overseeing FSTP implementation in the respective municipalities. Table 1 presents the number of participants from each case according to data collection method.

Data collection from the two sites was conducted consecutively, with the researcher personally facilitating face-to-face sessions from May to July 2023. Relevant secondary data were also gathered simultaneously. Informed consent forms were obtained from all the participants to ensure compliance with ethical standards. A structured questionnaire was administered prior to the interviews to collect the farmers' socioeconomic and demographic characteristics, while guided questions were used during the interviews, FGDs, and KIIs. The collected data were summarized and analyzed using thematic analysis, guided by the study's conceptual framework to identify and group recurring themes, trends, similarities, and differences. Notable themes, translated direct quotations, and participant narratives were integrated into the analysis and discussion. The names of the municipalities were omitted to protect participants' confidentiality and privacy.

Table 1. Number of participants per case by data collection procedure.

Data collection procedure	Case 1 Low training completion	Case 2 High training completion
Farmer interviews	16	27
Focus group discussions	6	8
Key informant interviews	3	3

RESULTS AND DISCUSSION

Case study context. The Farmer-Scientist Training Program (FSTP) is a nationwide initiative of the Department of Agriculture's Agricultural Training Institute (DA-ATI), implemented in partnership with the University of the Philippines Los Baños (UPLB), local government units (LGUs), and other agencies. Institutionalized through Executive Order No. 710 in 2008, the program develops farmer-scientists through a three-phase framework focusing on corn research and experimentation, technology adoption, and farmer-to-farmer knowledge transfer (Davide et al. 2016). The FSTP was implemented in both cases during the peak of the COVID-19 pandemic. Case 1 was conducted from December 2020 to 2022, while Case 2 took place from September 2020 to 2022. Participant attrition occurred primarily during Phase II. In Case 1, 50 percent of participants who completed Phase I advanced to the next phases, compared with 77.78 percent in Case 2 (Table 2).

Table 2. Training participants per phase.

Variable	Category	Case 1 Low training completion		Case 2 High training completion	
		F	%	F	%
Participants	Phase I	16	100	27	100
	Phase II	8	50	21	77.78
	Phase III	8	50	21	77.78

Participant's profile. Participants in both cases were predominantly women, aged 40 to 77, married, with household sizes exceeding three members. Most were seasoned farmers with 20 to 40 years of experience and owned farms of 1 to 2 hectares. Differences were observed in education and income

levels. Half of Case 1 participants attained tertiary education compared with only 18.52 percent in Case 2. Similarly, 50 percent of Case 1 participants had monthly household incomes above ₱10,000, whereas most Case 2 participants earned less than ₱10,000 and relied primarily on farming (Table 3).

Table 3. Key characteristics of 43 farmer-participants from two municipalities in Luzon, 2023.

Dominant characteristic	Case 1 Low training completion	Case 2 High training completion
Women (%)	50	59.26
Average age (years)	58	55
Age (range)	41-70	41-77
With tertiary education (%)	50	18.52
Married (%)	88.50	100
Average household size	4	5
Sole income from farming (%)	31.25	62.96
Monthly household income > ₱10,000 (%)	50	7.41
With 20-40 years of farming experience (%)	43.75	74.07
Owns farm (%)	75	62.96
Farm size of 1-2 ha (%)	50	62.96

Motivation of training participants. Across both cases, intrinsic motivation emerged as the primary driver of participation. Participants sought to acquire new knowledge, enhance farm productivity, and improve their families' livelihoods, consistent with the conceptualization of intrinsic motivation (Ryan and Deci 2000). In Case 1, many were motivated by their desire to learn and explore innovations in corn production to improve farming practices. A 61-year-old male participant stated, *"The changing agricultural landscape requires us farmers to adapt, and we can only do so by participating in various training programs offered by the LGU,"* while a training implementer added that "farmers are yearning for appropriate technologies and practices suited to their farming needs."

Similarly, participants in Case 2, many of whom were shifting from rice to corn production, expressed curiosity about the scientific methods introduced in the program. A 69-year-old male participant explained, *"We aim to learn the scientific ways of farming to enhance our yield and income, thus we value every training."* Some couples also joined to learn directly rather than rely on their spouses, and others were motivated by positive experiences in previous LGU-led programs.

Intrinsic motivation in both cases was complemented by extrinsic motivation, such as the challenge of sharing knowledge with fellow farmers, aspirations to gain recognition as "Farmer

Scientists," and the receipt of farming materials as incentives, all of which have been shown to support farmer participation in training programs (Akinmusola et al. 2016; Was et al. 2021). Likewise, previous studies highlight that farmers motivated by learning, self-improvement, and the perceived relevance of training are more likely to participate, remain engaged, and complete their training (Akinmusola et al. 2016; Bahtera et al. 2016: Charatsari et al. 2017; Mariyono et al. 2022; Zhu and Yang 2012).

External factors. In Case 1, participation was primarily constrained by the COVID-19 pandemic. Lockdowns caused the cancellation or rescheduling of sessions, while travel restrictions limited attendance and prevented trainers from conducting regular monitoring. These disruptions undermined participants' sense of autonomy and reduced motivation despite strong intrinsic motivation. A 59-year-old male discontinued training participation due to COVID-19 concerns, and a 70-year-old participant explained that although he was "very eager and inspired to participate in the first phase," worsening conditions during the second phase heightened his fear of infection, which eventually "overshadowed his interest in the training" and led to withdrawal. Distance and mobility constraints also discouraged participation; a 48-year-old female participant reported, "I live far away from the training, and sudden lockdowns and rescheduling of classes became a nuisance for me." Lockdowns further prevented participants whose farms were outside their barangays from conducting Phase II field experiments, resulting in automatic dropout for those unable to comply.

Unfavorable weather conditions, including typhoons, drought, and pest infestations, posed additional challenges, consistent with the identification of common abiotic stresses in Philippine corn production (Gerpacio et al. 2014). Personal circumstances also reduced participation. A 41-year-old male cited business commitments and time constraints from off-farm and non-farm work, similarly limited involvement, leading to discontinuation due to opportunity costs (Azumah et al. 2022; Praneetvatakul and Waibel 2001). Involvement in multiple livelihood activities can interfere with training activities and prompt individuals to prioritize immediate income-generating tasks (Alemu 2021; Azumah et al. 2022). Collectively, these external factors weakened motivation even among participants who initially demonstrated strong intrinsic motivation.

In Case 2, the pandemic had minimal impact and the program proceeded without lockdown-related disruptions. However, unfavorable weather and pest infestations required repetition of experiments and limited the involvement of older individuals in field activities. Despite a generally high completion rate, some participants were unable to finish the program. Attrition largely involved older female participants whose household responsibilities hindered their ability to maintain Phase II on-farm experiments. As one 55-year-old participant stated, she wished to complete the training but "could not comply with the on-farm setup," citing childcare and household chores. Another participant, aged 64, withdrew due to age-related health concerns. These patterns align with observation that farmers with limited labor resources are more likely to discontinue training (Waddington and White 2014). Additional withdrawals were due to competing professional or personal commitments; barangay officials struggled to fulfill training requirements alongside official duties, while a 44-year-old male participant exited after relocating to pursue business opportunities. This case illustrates how labor constraints, competing responsibilities, and livelihood transitions continue to shape participation even without pandemic-related disruptions.

Across both cases, family and organizational support helped sustain participation despite the challenges faced. This is consistent with earlier studies that revealed family encouragement reinforced adult learners' motivation and commitment (Terry 2007). In Case 1, participants came from diverse organizations, whereas in Case 2 most were siblings, relatives, or couples from farming households who collaborated and supported one another. Case 2 participants also belonged to the same farming association, fostering group cohesion and engagement. Peer and organizational support similarly promoted sustained participation (Park and Choi 2009). These findings indicate that participants'

motivation was strengthened through the fulfillment of the psychological need for relatedness, as described in Self-Determination Theory.

Internal factors. The lockdowns imposed during the COVID-19 pandemic constrained program implementation and prevented the training from being delivered according to its intended design. Although participants in both cases completed Phase I, which involved group-based experiments, attrition emerged in Phase II when individual on-farm experimentation was required. In Case 1, continuous lockdowns prevented most participants from conducting their individual experiments, and implementers were unable to provide regular monitoring or timely guidance, further limiting participants' ability to meet program requirements. One 43-year-old female participant withdrew due to miscommunication with implementers, highlighting the need for clearer support during experiment setup. The loss of contact during a period of heightened uncertainty contributed to feelings of hopelessness, reduced morale, and demotivation (Baynes et al. 2011). These disruptions also hindered the fulfillment of key psychological needs identified in Self-Determination Theory: competence, autonomy, and relatedness. Participants' sense of competence was weakened by their inability to carry out experiments effectively, their autonomy was constrained by limited control over the training process, and relatedness declined due to reduced interaction with implementers and peers.

To address these challenges, training implementers revised the program design by reverting to group-based experiments and organizing participants by barangay. However, this strategy remained infeasible for some participants due to miscommunication and conflicting commitments. As a 54-year-old female participant explained, "I wished to continue the training with my groupmates, but some were reluctant to proceed due to competing activities, which prevented us from conducting the experiment."

Despite these constraints, social integration played a critical role in sustaining participation among those who continued. Supportive peer relationships were an important motivational resource, particularly in overcoming logistical barriers. As one 48-year-old female participant described:

> *I live far from the training site, and I find participating challenging since I do not have a means of transportation. But, my co-trainees, who turned into friends, exerted their efforts and even picked me up to ensure I would participate. Had it not been for their support, I would not have been able to complete the training.*

This finding is consistent with earlier observations which demonstrated that social capital, fostered through training interactions, enhances sustained engagement by reinforcing collective commitment (Bahtera et al. 2016). Some participants were also motivated by a strong desire to learn, improve production, and derive satisfaction from the program's relevance to their needs. As a 47-year-old female participant explained:

> *As fortunate farmers selected as participants, it seemed only fitting to finish what we started. We had invested our time and effort and were committed to completing all three phases of FSTP. Moreover, I wanted to gain the experience of teaching our fellow farmers to test if I have what it takes to serve as a "Farmer-Scientists-Teacher."*

In Case 2, participants faced challenges related to unsuitable land and ongoing rice production during Phase II, prompting adjustments such as using alternative participants' farms and conducting on-farm experiments concurrently with Phase III. Consistent support and regular interaction with implementers inspired perseverance. Participants valued implementers' visits, which made them feel valued and provided an opportunity to voice concerns. The empathy demonstrated by implementers, along with field trip activities, encouraged active participation. Commitment to completing the program

was driven by a desire to learn, the relevance of the content to farming needs, and overall satisfaction with the training. These factors contributed to the high completion rate observed. A 48-year-old female participant shared that, despite being teased by younger neighbors for studying at an older age, she felt proud to gain practical knowledge beneficial to her livelihood.

CONCLUSION

The case of the Farmer-Scientist Training Program during the COVID-19 pandemic demonstrates that while intrinsic and extrinsic motivations effectively draw farmers into agricultural training, sustaining participation and achieving completion require supportive conditions across both external and internal domains. Pandemic-related restrictions, weather and pest pressures, and health concerns interacted with limitations in training design and implementation, creating barriers that were especially pronounced among participants facing mobility constraints, household responsibilities, or health vulnerabilities. Even in the case less affected by the pandemic, labor demands, competing responsibilities, and livelihood transitions continued to influence participation. These dynamics reveal that training completion depends not only on participants' motivation to engage but also on their ability to fulfill the psychological needs for competence, autonomy, and relatedness. The cases further showed that external factors such as family and organizational support, along with internal factors such as relationships with co-participants and trainers through social integration, play an important role in fostering a training environment that satisfies the need for relatedness. Likewise, modifications made by trainers to the program design, such as allowing group experiments, the use of other farms for on-farm experiments, and the simultaneous conduct of these activities alongside Phase III in consultation with participants, promoted adaptability and continuity. This reflected academic integration that allowed the training to proceed despite pandemic disruptions. These adjustments resulted in a program that was relevant and satisfactory to participants, supporting the fulfillment of competence and autonomy and ultimately contributing to training completion.

Moving forward beyond the pandemic, the findings highlight the importance of designing agricultural training programs that are both flexible and responsive to participants' needs and the contextual challenges that may arise over time. Mechanisms that strengthen social support, promote adaptive training design, and ensure relevance to the improvement of farmers' livelihoods should be prioritized. By addressing the various factors influencing participation, engagement and completion in agricultural training can be enhanced, delivering more effective programs that promote sustained learning, practical application, and long-term benefits for farmers and their communities.

Although this study identified factors influencing participation and completion in agricultural training, its qualitative design limits the generalizability of the findings. Future research could build on these insights by employing a quantitative or mixed-methods approach, which would provide a broader understanding of the determinants of participation and completion and enable more targeted strategies for improving agricultural training programs.

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Authorship Contributions:

Conceptualization: BAGC, MATQ, EPS, FCC; Study Design: BAGC, MATQ, EPS, FCC ; Sample Collection: BAGC ; Data Curation: BAGC, MATQ, EPS, FCC ; Visualization: BAGC ; Formal Analysis: BAGC ; Supervision: MATQ, EPS, FCC ;Writing – Original Draft Preparation: BAGC ; Writing – Review and Editing: BAGC, MATQ, EPS, FCC