EXPLORING INDIVIDUAL ENTREPRENEURIAL ORIENTATION AMONG INDONESIAN ALUMNI OF JAPAN'S TECHNICAL INTERN AND TRAINING PROGRAM IN THE AGRICULTURE SECTOR

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ABSTRACT

Although Japan's Technical Intern Training Program (TITP) was originally designed for workforce development rather than entrepreneurship, many Indonesian alumni have returned home and started their respective own agricultural enterprises. To understand this transformation, the study examined the Individual Entrepreneurial Orientation (IEO) of TITP alumni who have returned to Indonesia. Using exploratory factor analysis (EFA) on data collected from 75 respondents across Indonesia between November 2021 and August 2023, the study identified the key factors shaping their entrepreneurial orientation. The two main dimensions that emerged are: Autonomy–Leadership and Innovativeness–Risk Orientation. These dimensions together explain how training experiences influenced entrepreneurial behavior. Alumni from a Japanese host farm that provides regular financial and entrepreneurial classes (NT Farm), showed notably higher IEO levels. While the Technical Intern Program (TIP) alumni reported the highest average monthly income, their IEO scores did not align (correlate) with profit levels, suggesting different patterns of decision-making and enterprise management. Overall, the findings indicate that TITP's impact seemed to extend beyond technical skill transfer. Exposure to these structured, professional farming environments fostered autonomy, innovation, and confidence among returnees. Thus, strengthening post-return entrepreneurship support and financial literacy programs could help sustain this momentum and nurture a new generation of capable agripreneurs in Indonesia.

Key words: agriculture training*, agripreneur*, autonomy-leadership

INTRODUCTION

In recent years, Japan has been facing a significantly pressing challenge—a declining domestic population coupled with a lack of interest among its youth to pursue careers in the agricultural sector. According to MAFF Japan, the number of core persons mainly engaged in farming declined from approximately 1.36 million in 2020 to 1.23 million in 2022, where about 70% were aged 65 or older with an average age of 68.4 years (MAFF 2024). The 2025 (preliminary) figures show that the number of core agricultural workers is approximately 1.02 million, resulting to a further decline of about 25% from 2020 (MAFF Japan 2025). This level threatens production capacity if there are no new entrants or policy reforms that enhance

productivity (MAFF Japan 2022). Policy reports emphasize that securing agriculture labor has become increasingly difficult, stimulating a turn to foreign workers and technology while re-evaluating rural revitalization strategies. This situation raises deep concerns towards the sustainability of the agricultural sector. To secure it, the Japanese government has taken proactive steps to strengthen strategic cooperation with countries around the world. Among these measures is the long-standing instrument, the Foreign Technical Intern and Training Program (TITP) established in 1993. TITP plays a pivotal role as a bilateral instrument for skill transfer and human resource program in the agriculture sector.

TITP was legally designed to facilitate transfer of skills, technologies, and knowledge through on-the-job training to support human resource development in partner (mostly developing) countries; not to adjust Japan's domestic labor force (OTIT 2023). Yet, the program has evolved into a major labor and development path. By the end of 2023, around 400,000 technical intern trainees reside across Japan. However, it is important to note that TITP is currently undergoing major transformation. In February of 2024, the Japanese government formally resolved to replace TITP with the new Employment for Skill Development (ESD/Ikusei Shūrō Seido) scheme that is expected to come into effect between April to June 2027 (Japan Times 2024 and 2025). These reforms mark the importance of evaluating TITP's actual human capital and entrepreneurial impacts before its full replacement. Understanding how TITP alumni have developed entrepreneurial orientation and capabilities provides timely insights that help shape the design of the upcoming ESD framework.

Surprisingly, in the case of Indonesia, despite TITP's primary role for workforce development initiative, a significant number of Indonesian alumni were reported to establish various enterprises after returning home from Japan. Previous studies like Horiguchi (2019) describes the program as a platform for international cooperation and cultural exchange between Japan and the developing regions. Several have observed that participants often gain limited technical expertise but do develop strong Japanese work ethics, discipline (the Japanese 5S principles; *Seiri, Seiton, Seiso, Seiketsu, Shitsuke*), initial capital, and business networks that support post-return entrepreneurship (Faruq 2018; Ratnayake et.al. 2016; Syaukat and Hatanaka 2024). Ironically, the Indonesian government program explicitly designed to promote agriculture entrepreneurship (agripreneurship) has shown lesser success rates and shorter sustainability compared to TITP experiences. This contrast raises a crucial question: what specific factors are associated with the entrepreneurial behavior of TITP alumni, especially in agriculture? To address this question, this study adopted the Individual Entrepreneurial Orientation (IEO) framework, which captures the behavioral and psychological capabilities that shape how individuals recognize opportunities, take initiative, and manage risk under resource and institutional constraints (Bolton and Lane 2012; Lumpkin and Dess 1996).

Unlike firm-level Entrepreneurial Orientation (EO), IEO conceptualizes entrepreneurship as an individual-level capability, making it particularly suitable for analyzing agripreneurs who operate under uncertainty, limited capital, and incomplete market access (McElwee 2008). Prior research shows that individuals with stronger IEO tend to be more adaptable, innovative, and resilient; qualities crucial for sustaining farm-based enterprises (Mitchelmore and Rowley 2010; Rauch et al. 2009).

Following Bolton and Lane (2012), IEO comprises five dimensions: autonomy, risk taking, innovativeness, proactiveness, and competitive aggressiveness. In the agricultural context, these dimensions correspond respectively to self-directed farm management, willingness to adopt new technologies and crops, value-adding innovation, anticipatory market behavior, and persistent competitive effort under structural disadvantage.

For TITP alumni, such entrepreneurial capabilities may develop not through formal entrepreneurship training, but through prolonged exposure to Japan's disciplined work culture, standardized production systems, and management practices. These experiences may later translate into the ability to organize, lead, and innovate agribusiness ventures after returning home — providing a plausible mechanism explaining the unusually high incidence of agripreneurship among Indonesian TITP alumni.

Despite growing policies of interest in linking labor mobility and entrepreneurship, quantitative analyses of TITP alumni's EO remain limited. Most prior studies have been descriptive or qualitative, focusing on migration experiences rather than measuring entrepreneurial attributes (Syafitri et al. 2024; Syaukat et al. 2024; Yuniarto 2018). Therefore, this study aims to (1) evaluate the IEO levels of Indonesian TITP alumni engaged in agribusiness ventures, (2) determine the key variables that are associated with shaping their EO, and (3) examine how specific training characteristics and experiences relate to the development of IEO. Rather than testing causal models, this study sought to identify underlying behavioral patterns and policy-relevant implications found from the observed data, emphasizing interpretation over prediction. By doing so, this study contributes empirical evidence on how cross-national training experiences increase entrepreneurial capabilities in agriculture, insights that are vital for designing more effective human resource strategies under the forthcoming ESD framework.

RESEARCH METHODOLOGY

Conceptual framework. This research conceptualizes IEO as a psychological antecedent of entrepreneurial capabilities and activities. High levels of IEO can enhance a person's capacity to lead, recognize opportunities, and make prompt strategic decisions, collectively referred to as entrepreneurial capability. These aspects of IEO are often seen as predictors of entrepreneurial success and can indeed reflect an individual's entrepreneurial capabilities. Entrepreneurs with a strong IEO are likely to be more innovative, adaptable, and resilient – qualities that are crucial in the dynamic field of agriculture. At the same time, these individuals may also engage directly in entrepreneurial activities even without extensive training support, suggesting both direct and indirect pathways between IEO and entrepreneurial capabilities. Figure 1 summarizes this conceptual framework. IEO forms the behavioral foundation that shapes entrepreneurial capabilities and ultimately leads to entrepreneurial activity. In this study, this model is applied to assess how agriculture TITP training experiences influenced the EO and capability development of Indonesian alumni, particularly those who have ventured into agribusiness after returning.

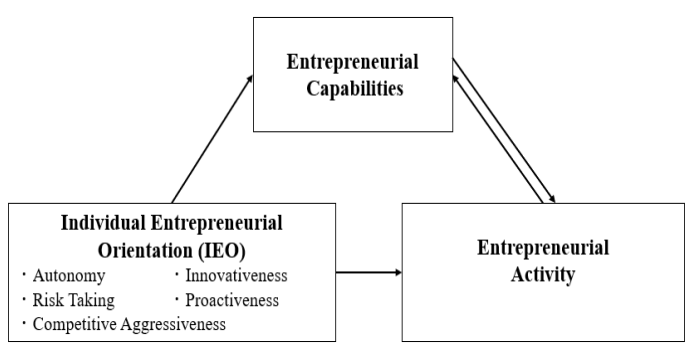


Figure 1. Conceptual framework of the study

Note: adapted from Bolton and Lane (2012), Lumpkin and Dess (1966), and Mitchelmore and Rowley (2010)

Respondents and data collection. Respondents consisted of Indonesian TITP alumni who had completed their agricultural training in Japan and returned to Indonesia. Primary data were collected through in-depth interviews and online questionnaires administered between November 2021 and August 2023. Recruitment of respondents presented significant challenges such as the absence of an alumni database and the total number of TITP alumni in agriculture. Although the questionnaire's Google Form link was distributed through alumni networks and social media groups of TITP returnees, the most effective approach proved to be the snowball sampling technique, wherein initial respondents referred to subsequent alumni within their network. This referral chain method resulted in a relatively limited sample size with a total of 75 valid respondents. These respondents represented alumni from various provinces across Indonesia, where more than 50% reside in Java Island.

Description of TITP sub-programs. Respondents in this study participated in one of three sub-programs under Japan's TITP in agriculture: the Industrial Training Program (ITP), the Technical Intern Program (TIP) which is the general pathway of TITP, and the NT Farm; a private farm in Fukui Prefecture that serves as a distinctive model combining technical and entrepreneurship learning for the trainees. At NT Farm, trainees are carefully selected among alumni of a top ranked agricultural vocational school (SMK Tanjung Sari) located in West Java, Indonesia. NT Farm was chosen as a study site because it is the only known farm in Japan that provides foreign trainees with structured financial literacy discussions and entrepreneurship classes, making it a unique and relevant example for examining enhanced learning opportunities within the TITP framework. Although the three programs share the same overall framework, they have slight differences (Table 1). The ITP program organized under the Indonesian Ministry of Agriculture, typically lasts up to one year and emphasizes practical training for young Indonesian farmers and is basically considered as pure internship hence the allowance, not wage. In contrast, the TIP operates through registered private Indonesian training organizations *(LPK - Lembaga Pelatihan Kerja)* focusing primarily on the development of on-the-job skills without formal education. The NT farm program differs remarkably; since it is a 3-year specialized training program for an agriculture vocational high school graduate that combines technical practice and entrepreneurship sessions.

Table 1. Comparison of Sub-Programs under TITP Examined in this Study

Main Difference	**Kenshu (ITP)**	**Ginou Jisshu-TIP (TITP in General)**	**NT Farm (Ideal Model Farm)**
Pre-departure Training	PS4/Organization under the Indonesian Ministry of Agriculture (MA)	Registered Training Organization (LPK), pays a min. of IDR 10 million	Not required, must study basic Japanese language before departure
Trainee Candidate	Young farmers or family member of farmer in Indonesia	Anyone who registered for training under official LPK	Alumni of Tanjung Sari Agriculture Vocational High School (SMK)
Selection of the Trainee	Selected by P4S (farmer group) under MA	Selected by farmer host (in Japan) via LPK through online interview	Selected by the principal of Tanjung Sari SMK
Length of Training	Possible up to < 3 years; majority < 1 year	2-5 years	3 years
Agriculture Training in	At the beginning and in the middle of program	None	Yes, around twice a month

Main Difference	Kenshu (ITP)	Ginou Jisshu-TIP (TITP in General)	NT Farm (Ideal Model Farm)
during Training (in Japan)			
Financial Literacy Education	Yes (starting from 2021)	None	Yes
Income	Allowance (around ¥40,000/month)	Wage (hourly; at least ¥100,000/month net)	Wage (hourly; at least ¥100,000/month net)
Accommodations (Lodging and Meals)	Free; provided by host farmer	Not provided; borne by the trainee	Not provided; borne by the trainee
Overtime	Not allowed, not paid	Allowed and paid	Allowed and paid

Source: Survey data 2021-2023

Measurement and IEO. IEO was measured using 26 statements adapted from established EO and IEO literature, contextualized to the agricultural sector. Each statement was rated on a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The items captured the five dimensions of IEO, innovativeness, proactiveness, risk-taking, autonomy, and competitive aggressiveness, reflecting behavioral tendencies relevant to agripreneurship. The questionnaire was pre-tested with a small group of TITP alumni for clarity, language accuracy, and internal consistency prior to final distribution.

Data analysis. Factor Analysis is a statistical technique that seeks to identify underlying relationships between observed variables. This method aims to simplify a large set of observed variables into fewer latent factors, which can then explain the observed correlations or covariances among the variables. This study employed a quantitative descriptive approach supported by exploratory factor analysis (EFA) to examine the underlying dimensions of IEO among the Indonesian alumni of TITP in agriculture. The analysis aimed to identify which behavioral and attitudinal factors most strongly characterize IEO within the agriculture trainees, without testing causal hypothesis. This approach is distinctive in the context of TITP since the primary objective of the program is not explicitly geared towards enhancing entrepreneurial skills. However, Indonesia stands out, potentially as one of the few, if not the only, sending country that recognizes TITP as a human resource development initiative. Given that a significant number of TITP alumni return and embark on entrepreneurial ventures, this analysis explores whether their experiences fostered entrepreneurial aptitude to effectively manage their agricultural enterprises.

Reliability and validity. To ensure the robustness of the measurement instruments and the appropriateness of the data for factor analysis, this study employed several diagnostic tests following standard procedures recommended in multivariate analysis literature (Field 2018; Hair et al. 2010).The Kaiser-Meyer-Olkin (KMO) test, Bartlett's Test of Sphericity, and Cronbach's Alpha were applied to ensure sampling adequacy, construct validity, and internal consistency of the IEO measurement items.

RESULTS AND DISCUSSION

Characteristics of farm and enterprises managed by TITP alumni. In this study, farmers are defined as individuals who cultivate their land and sell their produce through conventional channels such as intermediaries (the middleman) or directly to the local market. In contrast,

agripreneurs (farmer entrepreneurs) are those who not only engage in cultivation but also add value by processing their products and/or adopting innovative marketing strategies, including online platforms and direct-to-customer approaches. Understanding the structural characteristics of enterprises operated by the trainee alumni is essential to contextualize income disparities and entrepreneurial outcomes. On average, respondents owned 1.1 hectares of land, with agripreneurs managing slightly larger plots (an average of 1.5 ha) compared to conventional farmers. Prior to TITP, the average landholding was only 0.51 ha, indicating significant expansion post-training. More than 80% of alumni practice diversified farming, combining horticulture, livestock, and food processing to optimize returns and avoid relying on only one source of income (Syaukat and Hatanaka, 2024). The enterprises managed typically included vegetables, livestock/fishery, catering services, and agricultural input businesses, with some alumni managing up to four distinct enterprises. While there are 55 entrepreneurs, the total number of enterprises managed was 74. As to the combination of enterprises, it is known that alumni who combined farming with selling agriculture inputs or services earned the highest monthly profit from their enterprises, with more than IDR 8-15 million, far exceeding the national farmer average of IDR 1.28 million with those who cultivate 2 ha or less (Indonesian Census 2021). The diversification strategy, driven by land constraints and market opportunities, significantly influences profitability. These findings suggest that farm size and enterprise diversification are critical factors explaining income variation across TITP subprograms.

Overview of IEO among Agricultural TITP trainee alumni. The majority of the respondents were found to be engaged in agricultural production, processing, or agribusiness activities at the time of the survey. This research adopts the five-dimensional framework of IEO, encompassing autonomy, innovativeness, risk-taking, proactiveness, and competitive aggression. The analysis revealed that TITP alumni, though trained primarily for technical skill transfer rather than entrepreneurship, show measurable levels of IEO. This supports previous findings (Bolton and Lane 2012) that EO can manifest at the individual level, independent of formal business training.

IEO Scores based on entrepreneurial status. Respondents were first categorized according to their engagement in entrepreneurial activities. Approximately 90% derived income from the agricultural sector, and more than 80% are identified as entrepreneurs. In this study, "farmers" (conventional farmers) are defined as individuals engaged in land cultivation, distributing their produce conventionally through intermediaries or directly to the traditional markets. While "farmer entrepreneurs" or agripreneurs are those involved in land cultivation who employ innovative methods to market their products through digital platforms and other channels or process them to enhance their value.

(i) **Non-entrepreneurial respondents.** Sixteen percent of respondents reported non-entrepreneurial status, mostly working as conventional farmers or agricultural laborers. Among them the average IEO score was 78, the lowest among all groups. However, five respondents within this group achieved notably high IEO scores (≥120). This indicates that TITP participation may cultivate autonomy and proactive behaviors even among those engaged in traditional farming or wage-based agricultural work, consistent with the individual-level conceptualization of IEO. Several non-entrepreneurial respondents nevertheless reported expanding their farmland, adopting Japanese production methods, or improving management practices after returning. These cases suggest that exposure to structured work systems in Japan can foster an entrepreneurial mindset even in a non-enterprise context. Prior research from migration studies indicates that oversea work experience can facilitate skill and mindset transfer upon return, leading to adaptive and entrepreneurial practices (McCormick and Wahba, 2001)

(ii) **Entrepreneurial respondents.** Around 84% of respondents identified themselves as entrepreneurs or agripreneurs, primarily managing agribusinesses from production,

processing, to marketing of their products. Their average IEO score was 110. Notably higher than those who are non-entrepreneurs. Most of them operated small to medium scale enterprises such as vegetable farms, dairy and poultry operations, food processing units, and online product sales. A small number diversified into input trading, agriculture machinery rental, or agrotourism. This finding suggests that participation in TITP can translate into concrete entrepreneurial behavior when combined with post-return access to land, capital, or networks. Evidence from the return migration literature shows that returnees are significantly more likely to initiate entrepreneurial ventures when they have accumulated assets and resources such as land and savings (Bao et al. 2022). Another study mentions that migration serves as a household strategy for accumulating resources that facilitates entrepreneurial investment back home once they return (Zhou et al. 2024).

IEO Score by TITP sub-program. In this section, the respondents were categorized based on the specific sub-programs they undertook in Japan. These respondents were grouped into three distinct groups: ITP, TIP, and NT farm alumni. These programs differ in training duration, content, and learning structure as outlined earlier in the methodology section. Table 2 provides a summary of the IEO scores and average monthly profit of alumni across the sub-programs. In general, all groups showed relatively high IEO scores ranging from 110.5~113, indicating a relatively strong entrepreneurial mindset among returnees.

Table 2. Grouping of IEO Score of Entrepreneurs based on TITP Program

Program	n	IEO score (/130)	%	Ave. Monthly Agrib.* Profit (IDR)	Ave. Monthly Income (IDR)
ITP	31	110.5	85	1,330,000	3,635,000
TIP	27	111.9	86	5,216,667	6,616,667
NT Farm	10	113.0	87	2,280,000	4,700,000

Note: *Agrib. = Agribusiness; Total score of IEO is 130 Source: Survey data (2021-2023)

Although NT farm alumni have the highest average IEO score, the differences across programs were modest. This suggests that participation in TITP in general effectively cultivates EO, regardless of the program type. However, differences in program structure offer an important interpretive nuance. The NT Farm program, which combines technical practices with regular entrepreneurship classes, may foster a more balanced development of autonomy and innovativeness among other respondents. This tendency may reflect the structured nature of NT Farm's training system that encourages independent decision making and exposure to entrepreneurial thinking, dimensions that later emerge as two dominant factors shaping IEO in this study.

Regarding the average monthly profit of respondents, TIP alumni appear to have a marginally higher profit at approximately IDR 5,216,667. This is more than double the average earnings of ITP alumni (IDR 1,330,000) and NT Farm alumni (IDR 2,280,000). A potential explanation for this disparity could be the earnings of TIP alumni during their time in Japan. They earn a monthly wage between 90,000-200,000 JPY net (depending on season and overtime) for 2-5 years, potentially allowing them to save a significant amount. This capital could later be invested in their enterprises, in contrast to ITP alumni who received a stipend of just 40,000 JPY over 11 months during their training in Japan. Regarding the NT Farm alumni, the standard deviation for the average monthly profit and income is notably higher due to the limited number of alumni, rendering predictions less reliable. Also, over 80 % of NT Farm alumni have an additional source of income, not solely relying on their enterprise.

IEO scores of entrepreneurs based on profit. For a more comprehensive insight, the entrepreneurs were grouped into five groups based on their average monthly agribusiness profit (Table 3). Among the groups, a positive trend was observed; respondents with higher profits generally have higher IEO scores. This pattern suggests that IEO may contribute to improved enterprise performance. However, this pattern is not strictly linear. The group with the highest average profit (more than IDR 11,000,000) recorded slightly lower IEO scores (mean= 109.8) compared to those in the mid profit categories (Group 2-4, IEO=112.5-121). Closer examination revealed that these top-earning respondents were engaged in mixed enterprises, combining agriculture with service sectors, such as pharmacies, selling agricultural machinery, and managing an *LPK*. These diversified enterprises often employed several workers, suggesting that decision-making responsibilities were distributed, not concentrated in the owner, potentially explaining the lower IEO scores.

Table 3. Grouping of IEO score based on the average profit of enterprise.

Group	Ave. Monthly Agrib.* Profit (IDR)	n	Ave. IEO Score (/130)	%	Ave. Monthly Income (IDR)	± SD
1	900,000	8	104.2	80	2,536,364	± 1,332,989
2	2,000,000	30	112.5	87	4,471,429	± 2,563,321
3	4,500,000	13	114.4	88	5,566,667	± 2,528,944
4	8,000,000	3	121.0	93	6,166,667	± 1,649,916
5	11,000,000	4	109.8	84	11,000,000	± 1,082,532

Note: *Agrib. = Agribusiness; Source: Survey Data (2021-2023)

In contrast, mid-range earners (Group 3 and 4) tend to remain deeply involved in production, marketing, and financial management. These individuals demonstrated more active problem-solving and creativity in improving their businesses, which may explain higher IEO scores. Several respondents also mentioned during interviews that their training experience in Japanese farms has reshaped their perception of farming. Before TITP, they did not think of farming as a business, but exposure to Japan's work ethics and structured farm management systems inspired them to approach farming as a business and a profession to take pride in. This shift in attitude seems to have strengthened their motivation and confidence to innovate after returning home.

Overall, these findings show that IEO not only reflects entrepreneurial intention but also behavioral engagement and mindset transformation. Alumni who adopted Japan's disciplined farming practices tended to develop a more proactive and improvement-oriented approach in managing their business, an attitude that, as shown in the next section, aligns with the key dimensions identified through factor analysis.

Factor analysis of trainee alumni IEO. Exploratory Factor Analysis (EFA) was employed using 26 items representing the five IEO dimensions. Prior to extraction, the dataset was tested to confirm suitability. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy yielded a value of 0.88, exceeding the recommended threshold of 0.60, while Bartlett's Test of Sphericity was statistically significant ($\chi^2 = 1140.52$, $p < 0.001$), confirming that correlations among

variables were adequate for factor analysis. To ensure internal consistency, Cronbach's Alpha was calculated for the 26 items, producing a coefficient of 0.97, indicating excellent reliability. Each extracted factor also demonstrated strong construct reliability, with alpha values above 0.70.

Following the latent root criterion (eigenvalue > 1) and examination of the scree plot, two key factors were extracted, explaining 51% of the total variance. Ideally, a cumulative variance exceeding 60% is preferred. However, the scree plot (Fig. 2) indicates an elbow after just two factors. The objective of factor analysis is to elucidate the most variance using the fewest factors (Nunnally and Bernstein 1994). Given this, it was determined that the two-factor solution is adequate. Table 4 provides detailed information on factor loadings. The two dominant dimensions were labeled as:

(i) *Autonomy-Leadership:* capturing independence in decision-making, interpersonal management, and the ability to lead teams.

(ii) *Innovativeness-Risk Orientation:* reflecting openness to experimentation, creativity, and the willingness to take calculated risks in pursuing new opportunities.

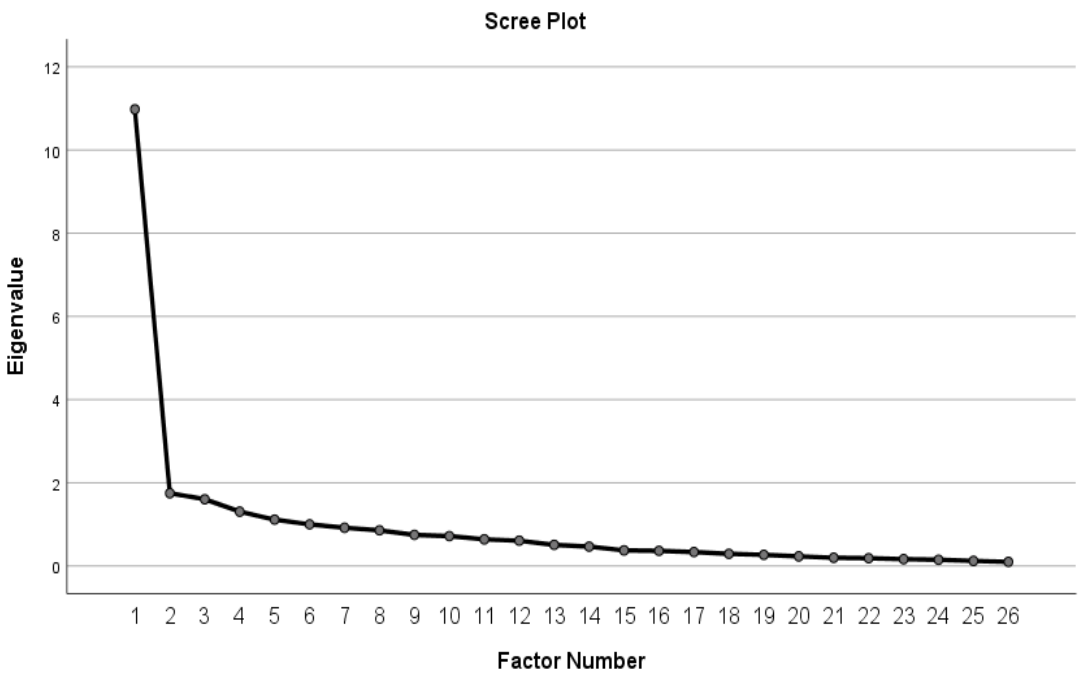


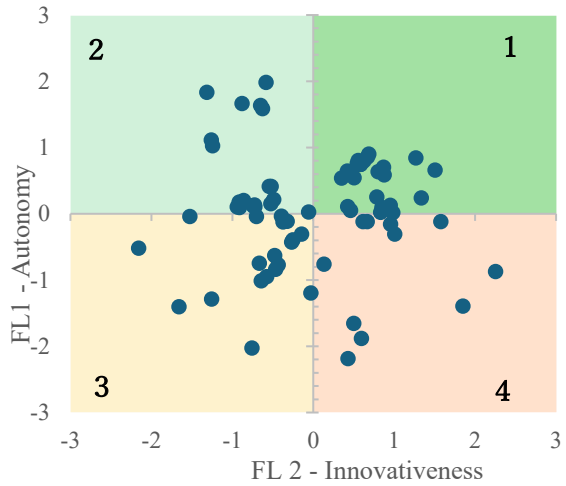
Figure 2. Scree plot of factor analysis results

Table 4. Factor analysis results

Dimension	Factor 1		Factor 2	
	Autonomy - Leadership		Innovativeness- Risk Orientation	
	Factor Loading			
"I can accept critics and suggestions from others"	-	0.73	-	-
"I have good relationships with other people"	-	0.67	-	-
"I can manage team work well"	-	0.66	-	-
"I often find new ideas for my business"	-	-	-	0.81
"I find different ways to achieve the same result"	-	-	-	0.69
"I often find new innovations in the field I am in"	-	-	-	0.68
Kaiser-Meyer-Olkin Measure of Sampling Adequacy				0.88
Bartlett's Test of Sphericity	Approx. Chi-Square			1140.52
	df			325
	Sig.			0.000

Based on the factor scores, respondents were categorized into four groups (Fig. 3). The majority of the respondents (32%) belonged to Group 1, characterized by high scores in both Autonomy-Leadership and Innovativeness-Risk Orientation. This study found that 82% of the NTF farm alumni belong in Group 1, and the remaining 18% belong in Group 2. NTF farm is the only farm that gives routine financial and entrepreneurial education to its trainees. This shows that financial and entrepreneurial education during training in Japan has helped foster both confidence and innovative thinking. These findings align with Japanese research emphasizing that the management philosophy of host farms plays a crucial role in skill and mindset transfer. Nikaido (2021) found that agricultural employers who view trainees as future collaborators rather than temporary laborers foster stronger autonomy and proactive learning—conditions that appear to resonate with the "Autonomy–Leadership" and "Innovativeness–Risk" dimensions identified in this study.

However, respondents in Groups 3 and 4 were mainly composed of slightly older alumni with longer post-return experience, displaying lower Innovativeness-Risk Orientation but moderate Autonomy-Leadership scores. This suggests that age and accumulated managerial experience may shift focus from innovation toward operational stability and team coordination, a trend also reported in prior entrepreneurship research (Rauch and Frese 2007).



Group	n	%	(Autonomy) (Innovativeness)
1	24	32	(+) (+)
2	11	15	(+) (-)
3	20	27	(-) (-)
4	19	26	(-) (+)

Figure 3. Grouping of respondents based on autonomy-managements and innovativeness-risk factor loading

Table 5 shows the distinct demographic patterns across the four groups derived from factor analysis. Groups 1 and 2 are dominated by younger alumni. These people show higher Autonomy-Leadership and Innovativeness-Risk Orientation, suggesting that young returnees tend to apply skills obtained from TITP more dynamically in their enterprises. In contrast, Group 3 and 4, members with average age of 35 years and have been back in Indonesia for more than 10 years, show lower Innovativeness-Risk Orientation but maintain moderate (better) Autonomy, indicating a shift toward managerial stability and operational control with experience.

Table 5. General demographic profile of the FA groups

Group	Autonomy - Leadership	Innovative-Risk	Age	Training Length (Years)	Years After Return	Entp.* Experience (years)	Land Owned (Ha)
1	0.736	0.196	31.6	1.77	7.97	5.9	1.31
2	0.776	-0.112	31.4	1.68	7.88	4.9	1.24
3	-0.664	0.006	35.7	1.86	11.09	7.9	1.21
4	-0.732	-0.035	35.3	1.78	10.38	7.7	1.28

Note: *Entrepreneurship Source: Survey data (2021-2023)

Interestingly, the length of training (1.6-1.8 years) is consistent across all groups, implying that training quality gives stronger influence on IEO outcomes compared to the duration of training. It is worth noting that the average effective duration for the successful alumni is around 1.7 to 1.8 years. This may indicate that programs with a very short duration, such as those under one year, are less effective in fostering an entrepreneurial orientation. Future programs, such as the ESD, should consider the duration of training more thoroughly.

CONCLUSION

This study provides quantitative evidence that participation in TITP fosters stronger autonomy-leadership, and innovativeness-risk orientations among Indonesian alumni. Exposure to Japan's structured agricultural environment and professional work culture has contributed to developing a stronger sense of responsibility, initiative, and adaptive thinking among trainees; traits that remain vital after returning home. These behavioral transformations suggest that TITP seems to serve not only as a platform to transfer technical skills but also as a formative experience that cultivates entrepreneurial mindset development. This confirmed the importance of entrepreneurship education and mentorship within technical training programs. Specifically, fostering autonomy and innovativeness can enhance rural livelihoods and sustain the growth of agripreneurship in Indonesia. It is worth noting that the average effective duration for successful alumni is approximately 1.7 to 1.8 years, suggesting that programs shorter than one year may be less effective in fostering entrepreneurial orientation.

This research is limited by its relatively small sample size and focuses on Indonesian alumni of the Japanese agricultural TITP, which may restrict the generalization of findings to other countries or programs. Moreover, the use of self-reported data could introduce response bias. Despite these constraints, the identification of Autonomy-Leadership and Innovativeness-Risk Orientation as dominant IEO dimensions suggests a clear policy direction: integrating entrepreneurship-focused modules and ensuring post-return support within TITP and similar programs could significantly improve their long-term impact on agribusiness development.

For further studies, comparative studies between TITP and the newer Specified Skilled Workers (SSW) program would also help clarify how differences in program design and structure could influence long-term employability, entrepreneurial orientation, and local economic contribution. Multi-country approaches would further explain how institutional and cultural contexts mediate the experience of overseas training into sustainable agribusiness development. As for the upcoming ESD program revision expected in 2027, the findings indicate the value of retaining and strengthening entrepreneurial development components, including structured learning modules and post-return support systems to enhance the long-term developmental impact of overseas agricultural training.

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