From Interns to Entrepreneurs: The African Business Education Initiative's Impact on Entrepreneurial Aspiration

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Abstract

Entrepreneurs play critical roles in driving economic growth, and recent evidence suggests that entrepreneurial skills can be developed through job training. Yet little is known about the conditions under which such training shapes entrepreneurial mindsets. This study examines how management and work environment factors influence entrepreneurial aspiration. We draw on a novel survey dataset collected from participants in the African Business Education Initiative—a program that aims to develop Africa's industrial human resources. Our findings consistently demonstrate that task clarity, role-match, and mentorship positively influence entrepreneurial aspiration, whereas facing adaptability challenges has no meaningful effect. Jointly, task clarity and role-match exerted greater influence on entrepreneurial aspiration than either factor alone, highlighting their complementarity relationship. Furthermore, mentorship appeared to play a compensatory role by offsetting any potential negative effect of adaptability challenges on entrepreneurial aspiration. Further analysis showed that management factors played a larger role in promoting entrepreneurial aspirations than work environment factors. These findings suggest that a well-structured internship program that emphasizes clear responsibilities, role alignment, and strong mentorship can cultivate future entrepreneurial leaders who can foster entrepreneurship and drive innovation in Africa.

Keywords: management factors, work environment factors, entrepreneurial aspiration

JEL Classification: L26, J24, O15

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1. Introduction

Entrepreneurs play a critical role in economic development by identifying promising opportunities, taking risks, and starting new businesses (UNIDO, 2024; Sanyang and Huang, 2010). They also drive innovation, which is important for industrialization, economic growth, and poverty reduction (Otsuka, 2024; Kim et al., 2022; Rusu et al., 2022). An important finding in recent literature is that entrepreneurial skills can be cultivated through training (McKenzie et al., 2023; Alcid et al., 2023; Bloom et al., 2020; Berge et al., 2012).

Job training can take various forms, but internships are particularly effective for building skills, clarifying career goals, and applying academic knowledge in real-world contexts (To and Lung, 2020; D'Abate et al., 2009). Beyond improving employment prospects (Tobback et al., 2024; Neyt et al., 2022; Van Belle et al., 2020), internships provide relevant industry-specific knowledge and experience that can shape individuals' entrepreneurial mindset, encouraging initiative, creativity, and opportunity recognition. These traits are necessary for translating ideas into economic opportunities (Da Mata et al., 2025).

Although no specific theory has been developed to explain the factors that nurture entrepreneurship, the Job Characteristic Model (JCM) by Hackman and Oldham (1976) provides a useful framework for this study. The model outlines five core job characteristics—skill variety, task identity, task significance, autonomy, and feedback—that contribute to beneficial personal and work outcomes by shaping how individuals derive meaning, motivation, and satisfaction from their work experience. Over time, the model has been extended, with factors broadly classified into two categories: management factors and work environment factors (To and Lung, 2020; D'Abate et al., 2009). In general, management factors are job traits related to an employee's work, which, in addition to the five JCM characteristics, include task clarity and role-matching (To and Lung, 2020; Vila and Garcia-Mora, 2005). On the other hand, work environment factors refer to attributes of the general work environment beyond the job itself, including mentorship, opportunities for learning, and career development (Mumford and Sechel, 2019; D'Abate et al., 2009).

Empirically, the JCM has been predominantly applied in studies examining job satisfaction among full-time employees (Dilmaghani, 2021; Mumford and Sechel, 2019; Vila and Garcia-Mora, 2005) and interns (Maaravi et al., 2021; To and Lung, 2020; Hussein and Lopa, 2018; Petrila et al., 2015; D'Abate et al., 2009). However, the analytical results from these studies are mixed. Relating to intern satisfaction, for instance, D'Abate et al. (2009) found that among US business school interns, only task significance and feedback significantly increased internship satisfaction, while task identity, skill variety, and autonomy had no significant effect. In a similar study of undergraduate students in Israel, Maaravi et al. (2021) found positive effects for task significance and task variety, a negative effect for feedback, and no significant effect for autonomy. In contrast, Hussein and Lopa (2018) found that skill variety and autonomy were predictors of higher internship satisfaction among students in the USA. Furthermore, To and Lung (2020) and Petrila et al. (2015) found that supervisor support positively contributes to intern satisfaction.

Regarding job satisfaction, Mumford and Sechel (2019) identified mentorship and a cooperative workplace climate as key determinants, whereas Vila and Garcia-Mora (2005) found that role-matching between job requirements and employee qualifications significantly enhanced job satisfaction. While these studies advance our understanding of job/internship satisfaction, less is known about how these factors shape entrepreneurial mindsets. Also, although all these studies used survey data, their analyses remain limited in scope, as participants were mostly drawn from single-country contexts or confined to specific academic disciplines, thereby reducing their external validity.

Drawing on insights from a survey of African Business Education Initiative (ABEI) scholars, this study contributes to the broader literature on human capital development and entrepreneurship. The ABEI program aims to foster industrial development in Africa by offering scholarships and internships for Africans to study in Japan. This approach is based on Japan's own strategy in the late nineteenth and early 20th centuries, when it sent scholars to Western countries to learn science, technology, and management (Ghadimi, 2023; Hashino and Murata, 2024). Through the ABEI program, participants receive advanced academic training and internship experience in Japan, with the expectation that they will return to their home countries and apply this knowledge to promote industrial development. For the internship, scholars are required to complete a mandatory summer internship lasting up to one month, with the option to extend it for up to six months after graduation. This setup creates natural variation

in internship length, providing a unique opportunity to examine how internship-related factors shape entrepreneurial mindset. Internship-related factors in this study include job characteristics associated with the nature of interns' work, including their roles and responsibilities during the internship, and the company's organizational structure, which may include supervisor support and working language. Respectively, these factors align with the management and work environment factors in JCM. Accordingly, this study examines how management and work environment factors influence entrepreneurial aspiration.[4]

Against this backdrop, the study makes three key contributions to the literature on international training programs and internships. First, unlike previous studies that primarily examine what factors contribute to a positive internship experience (e.g., Maaravi et al., 2021; To and Lung, 2020; Hussein and Lopa, 2018; Petrila et al., 2015; D'Abate et al., 2009), this study focuses on which aspects of an internship encourage entrepreneurial activities afterwards. Consequently, the study offers a different perspective through which the role of internships can be evaluated. Second, by surveying ABEI scholars, this study benefits from participants' experiences across different African countries and academic disciplines. This diversity broadens the scope of internship research beyond single-country or single-discipline contexts, thereby enhancing the external validity of our findings. Third, considering the cross-cultural context of the ABEI program, this study introduces new variables (language barrier and adaptability challenge) to account for potential cross-cultural effects.

The results consistently show that task clarity, role-match, and mentorship are key predictors of entrepreneurial aspiration. Further analysis reveals that the combined presence of task clarity and role-match exerts a stronger influence on entrepreneurial aspiration than either factor alone, suggesting complementarity between them. Conversely, in the presence of adaptability difficulties, mentorship positively influences entrepreneurial aspiration, indicating its compensatory and offsetting role. Overall, these findings underscore the critical role of management and work environment factors in shaping the entrepreneurial mindset.

The remainder of this paper is structured as follows. Section 2 provides an overview of the ABEI program. Section 3 outlines the survey's structure and design, including variable construction and a summary of the data. Section 4 presents and discusses results from the

[4] The term entrepreneurial aspiration is used interchangeably with the term entrepreneurial mindset throughout the text.

study's empirical analysis. Finally, Section 5 concludes with a summary of the main findings and their policy implications.

2. Overview of ABEI

The ABEI was launched in 2013 during the Fifth Tokyo International Conference on African Development in Yokohama, Japan. The basic idea behind this initiative is to transfer Japan's successful development experience to Africa by training young African professionals, mainly from the private sector, as well as public-sector officials involved in investment promotion and industrialization policy. The program design resembles Japan's own pathway to industrialization over the last one and a half centuries, during which young Japanese professionals were actively trained abroad.[5] This strategy was critical in advancing Japan's rapid modernization and economic transformation (Ghadimi, 2023). Thus, by adapting this model, the ABEI seeks to foster industrial growth in Africa by developing its human resource capacity.

Two overarching goals drive the program. The first is to strengthen Africa's human resource capacity by training business-minded professionals who can later act as catalysts for industrial growth. The second is for the trained individuals to build networks with professionals in Japan to facilitate cross-country investment. The program's rationale aligns with the established development strategy of building human capital to promote industrial growth (Otsuka, 2024; Cunningham et al., 2023).[6]

To develop students' technical and social competencies, the ABEI program combines academic training (a two-year master's program) and practical business exposure (internship). This framework enables participants not only to acquire advanced academic knowledge but also to gain firsthand practical experience by working with Japanese companies and organizations. This study focuses on participants' internship experience.

[5] In the late 19th century, the Ministry of Agriculture and Commerce established an overseas training program aimed at cultivating human resources for industrial promotion, which continued for approximately 30 years. According to Kiyama (forthcoming), around 900 Japanese scholars were dispatched overseas to acquire new technologies and market information. Evidence of this can be traced to the diffusion of foreign innovation within Japan's textile industry. As noted by Hashino and Murata (2024), in 1872 Japanese craftsmen sent by the Kyoto prefectural government received training in France on advanced weaving techniques. Upon their return, they successfully introduced the Jacquard and flying shuttle for silk weaving, marking a new phase in Japan's industrial development in the silk-weaving industry.

[6] Specifically, Otsuka (2024) argued that investment in human capital through the training of major decision makers, such as entrepreneurs, is essential for industrial development as it encourages innovation in developing countries.

The ABEI program's application process typically runs for three months (July–September). Eligible candidates apply through their respective Japan International Cooperation Agency (JICA) country offices.[7] After document screening, shortlisted candidates are invited for an interview. Successful interviewees are then required to apply for admission to a Japanese university of their choice, and those who secure admission receive a formal invitation to participate in the program and undertake a master's program in Japan.[8] To date, JICA has trained 1,888 scholars through this program (Figure 1).

2.1. ABEI internship

Since the focus of this study is on the internship component, it is imperative to discuss its structure and design. The program has two types of internships: a summer internship and a post-graduation internship. The summer internship is mandatory and is organized during the summer break at Japanese universities. This internship lasts between one and four weeks. In contrast, the post-graduation internship is optional and is available only to participants who secure a placement with a host company or organization. This internship can last up to six months (≈ 24 weeks). Considering both internship possibilities, ABEI scholars can have in total between 1 and 28 weeks of internship experience by the time they graduate. For those who take part in both internships, placements can be at the same host organization or at different locations.

With JICA's help, students receive a list of prescreened companies willing to accept ABEI applicants. As of 2023, JICA had a memorandum of understanding with 431 companies for this purpose (JICA, 2024). Moreover, prior to the start of the summer internship, JICA organizes networking events—both online and in-person—for participants and potential host companies to interact.

Beyond providing practical experience, the internship is designed to foster and nurture entrepreneurial aspirations. Through their internships, ABEI scholars are not only exposed to new business ideas but also to new insights into companies' operational strategies. Equipped with this information and experience, participants are expected to promote economic

[7] JICA is the implementing agency of the program, which provides support to scholars by managing logistics and providing guidance throughout their stay in Japan.

[8] The scholarship program provides scholars with a comprehensive financial package including full tuition coverage, a monthly stipend, research funding, a relocation allowance, and a round-trip airfare between Japan and their home country.

development in their home countries, particularly through entrepreneurial initiatives, by applying what they learned.

To realize these objectives, internship training must be meaningful and relevant. Therefore, how clearly defined and relevant the tasks are, and the presence of mentors, become important. Thus, understanding the internship experiences of ABEI scholars provides important information for designing internships that not only enhance learning but also nurture entrepreneurial ambitions.

3. ABEI survey

We surveyed ABEI scholars using an online questionnaire from February 19 to May 20, 2025.[9] The implementing agency, JICA, helped distribute the questionnaire by emailing it to all ABEI participants—past and present. This collaboration provided access to the entire program population, reducing the risk of bias from a non-representative sample.

The questionnaire was divided into two sections: (1) demographic information, and (2) ABEI experience. The first section gathers background information about respondents, including their age, nationality, sex, pre-ABEI employment status, field of study during ABEI, and their motivations for applying to the program. In particular, details about participants' motivations not only help address individual predispositions that could influence behavior but also reduce potential bias arising from omitted variables. Given that perceptions are inherently subjective, having objective background information is essential to control for observable characteristics prior to the program.

The second section provides details regarding participants' experiences with the ABEI. It covers coursework, internships, and networking events. Information about internships includes internship type (summer and/or post-graduation), duration, and experience. Furthermore, the survey asked participants about their past experiences with leadership and networking, serving as a proxy for assessing a participant's innate abilities that are otherwise difficult to observe.

3.1. Variable construction

[9] It is important to note that this was done only after receiving approval from the Ethics Committee in the Department of Economics at Kobe University.

Here, we discuss only the construction of the main variables of interest: entrepreneurial aspiration, management factors, and work environment factors. These variables were derived from questions about participants' internship experiences. *Entrepreneurial aspiration* is a composite score measured from responses to two questions where participants were asked to rate how their internship influenced their (1) decision to become an entrepreneur (or consider engaging in entrepreneurship), reflecting one's desire to start an enterprise; and (2) decision to build strong ties for future business collaboration with Japanese companies. Both items were assessed on a five-point ordinal scale (1 = not at all influential, 5 = greatly influential). The two scores were then averaged to form the measure of entrepreneurial aspiration.

The *management* and *work environment factors* were generated from questions measured as binary responses (*Yes*/*No*). Specifically, management factors include *task clarity* (defined as receiving clear or unclear instructions about tasks) and role-match (defined as being assigned a task that is related or unrelated to one's career goals or expectations). Work environment factors include dummy variables for *mentorship* (whether a person received supportive guidance), *language barrier* (whether a person experienced language difficulties), and adaptability challenge (whether a person experienced challenges adapting to the host company's work environment).

3.2. Descriptive analysis

Although the program is currently in its 11th year, the survey was restricted to graduates from the first 10 cohorts (i.e., those who had already graduated). We obtained 320 responses, representing 18% of the total population across these cohorts. Figure 2 shows the distribution of survey responses in Panel A, as well as the sample share of the population by cohort-year in Panel B. The survey also generated considerable variation across countries, academic disciplines, and universities that participants attended in Japan (see Appendix Figures A1, A2, and A3).

The cross-tabulation analysis (Table 1) shows the distribution of entrepreneurial aspiration based on internship-related factors.[10] For ease of interpretation and assessment, entrepreneurial aspiration is transformed to reflect the five-point ordinal scale of its individual constructs.

[10] We use cross-tabulation rather than simple descriptive statistics because all key variables are either binary or categorical, and on their own, offer little to no interpretive value.

For management factors, 93% of respondents reported that tasks assigned to them were clearly defined. Many of them rate the internship's influence on their entrepreneurial aspiration as 'influential' or 'greatly influential' in comparison to those who reported that assigned tasks were not clear. Similarly, nearly 77% of respondents reported that their internship roles aligned with their interests or expectations, and many scholars (20.4%) in this group indicated that their internship had a great impact on their entrepreneurial aspiration, compared with those who felt otherwise (9.3%). These results strongly indicate that having well-defined tasks and a good role fit are essential for a meaningful internship experience.

Regarding work environment factors, 93.7% of respondents reported receiving mentorship. Generally, these respondents also judged the internship favorably. In sharp contrast, those lacking mentorship tended to rate the internship less favorably. For instance, half of the respondents in this group rated the internship's impact on their entrepreneurial aspiration as either 'not influential' (25%) or 'not at all influential' (25%). In comparison, 35% maintained a neutral stance. Regarding language barrier, respondents were distributed fairly evenly between those who experienced difficulties (46%) and those who did not (54%). Facing an adaptability challenge was less common: 82% said they experienced no challenge adjusting to their working environment, while 18% said they did. Notwithstanding, there is little difference in entrepreneurial aspiration between respondents who reported experiencing a language barrier or an adaptability challenge and those who did not. This suggests that the internship's influence on entrepreneurial aspiration is more strongly shaped by other factors, such as mentorship, rather than by challenges that participants in a cross-cultural setting, such as the ABEI program, are likely to anticipate.

Table 2 presents the distribution of entrepreneurial aspiration by respondents' demographic characteristics and fields of study in Japan. The results show higher entrepreneurial aspiration among males and respondents in older age groups. It can be further observed that the effect of internship experience on entrepreneurial aspiration varies significantly across academic fields. Participants in STEM (science, technology, engineering, and mathematics) and in business and management were the most likely to report that their internship had a highly influential impact. In contrast, participants in the humanities and education were the least likely to do so. For completeness, the appendix shows the results on the distribution of the decomposed indicators

used to measure entrepreneurial aspiration.[11] The results for management and work environment factors are in Table A1 and Table A2, while those for respondents' demographic characteristics are presented in Table A3 and Table A4.

While the descriptive tables provide useful insights into how internship-related factors affect entrepreneurial aspiration, they cannot establish whether these factors significantly explain variation in entrepreneurial aspiration. We address this limitation using regression analysis.

4. Empirical analysis

4.1 Regression model

We use the following regression model to examine how management and work environment factors influence entrepreneurial aspiration:

$$EA_i = \beta_0 + \beta_1 TC_i + \beta_2 RM_i + \beta_3 Ment_i + \beta_4 Lang_i + \beta_5 Adap_i + \beta_5 Int\_dur_i + \theta' X_i + \mu_t + \varepsilon_i \quad (1)$$

where EA_i is the entrepreneurial aspiration of respondent i. TC_i, RM_i, $Ment_i$, $Lang_i$, and $Adap_i$ are the main independent variables of interest representing task clarity, role-match, mentorship, language barrier, and adaptability challenge, respectively. As outlined in Section 3.1, these binary variables capture both management factors (*TC* and *RM*) and work environment factors (*Ment*, *Lang*, and *Adap*) that characterize each respondent's internship experience. Other variables include *Int_duri*, representing internship duration (measured in weeks), and X_i, a vector of control variables. Detailed definitions of these variables are shown in Appendix Table A5. To account for unobserved differences across cohorts, cohort-year fixed effects, μ_t, are introduced, indicating the enrollment year. Finally, βs and θ are the parameters to be estimated, and ε is the idiosyncratic error term capturing unobserved individual-level influences on entrepreneurial aspiration.

From Equation (1), it is expected that the management factors—task clarity and role-match—will lead to higher entrepreneurial aspiration (i.e., $\beta_1 > 0$ and $\beta_2 > 0$). With respect to task clarity, well-defined tasks reduce ambiguity and ensure better comprehension, which, in turn, enable

[11] The first construct is defined as *entrepreneurial consideration* indicating the decision to become an entrepreneur or consider engaging in entrepreneurship, while the second construct is defined as *collaboration* indicating the decision to build strong ties for future business collaboration with Japanese companies. The results shown are not significantly different from what is observed for the composite measure.

interns to gain transferable skills that can positively shape their experience (To and Lung, 2020). Similarly, when an intern's role aligns with their academic background, career interests, or expectations, they develop greater motivation for learning (Vila and Garcia-Mora, 2005). Consequently, a good role-match positively shapes their internship experience and fosters entrepreneurial aspiration. With regard to work environment factors, it is expected that $\beta 3 > 0$, as mentors provide support, guidance, and feedback, and assist mentees in making decisions about their career paths (Sanfilippo, 2025). This can enhance interns' learning and training experience, which in turn will positively shape their entrepreneurial aspirations (To and Lung, 2020; Mumford and Sechel, 2019; Petrila et al., 2015). In contrast, it is expected that $\beta_4 < 0$ and $\beta_5 < 0$, because working in an unfamiliar environment might lead to integration difficulties, especially in the context of the ABEI program, where African students undertake internships in Japanese companies. In this study, language barriers and challenges of adaptability are identified as the most likely obstacles to workplace integration. Therefore, these cultural challenges are expected to hinder interns' ability to engage effectively, integrate, and develop their skills, potentially negatively affecting their entrepreneurial aspirations.

Beyond the fairly obvious expectations from the baseline model, this study goes a step further to understand how the joint effects of certain variables can influence the outcome variable. Of particular interest are two interaction terms. The first interaction is between *TC* and *RM,* which are conceptually related to the management factors. It is more likely that a well-defined task becomes more valuable when an intern's role is well matched with their expectations, and vice versa. The second interaction is between *Ment* and *Adap*. Both variables describe the work environment, and together they reflect how supportive guidance for interns interacts with their ability to adjust to an unfamiliar work environment. Taken together, mentorship may offset or significantly reduce adaptability challenges by providing direction and encouragement to interns, thereby revealing a possible offsetting effect. Therefore, to examine how these joint effects may influence entrepreneurial aspiration, Equation (1) is extended as follows:

$$EA_i = \alpha_0 + \alpha_1 TC_i + \alpha_2 RM_i + \alpha_3 (TC \times RM)_i + \alpha_4 Ment_i + \alpha_5 Adap_i + \alpha_6 (Ment \times Adap)_i + \alpha_7 Lang_i + \alpha_7 Int\_dur_i + \varphi' X_i + \mu_t + \varepsilon_i \quad (2)$$

The definitions of all the terms in Equation (2) remain the same as in Equation (1) except for α and φ, which represent parameters to be estimated. From Equation (2), several hypotheses are derived. Following the same line of argument as before, we expect the signs of α_1 and α_2 to be positive. Moreover, we expect the effect of having both task clarity and role-match (α_3)

to be positive and greater than α_1 and α_2, because the combination of the two can be mutually reinforcing. This combined condition is expected to exert the strongest positive influence on interns' entrepreneurial aspiration compared to just task clarity or role-match alone. Accordingly, the following hypothesis is formulated:

H1: The effect of having both task clarity and role-match is greater than the effect of having only task clarity or role-match.

Similarly, it is expected that $\alpha_4 > 0$ and $\alpha_5 < 0$, using the same argument as in the baseline model. However, we expect the effect of receiving mentorship while facing adaptability challenges, α_6, to be positive. The reasoning behind this is that interns are likely to start their internships fully aware of potential cultural challenges and, as such, may see these differences as part of their learning process rather than obstacles. This readiness can reduce the negative impact of any cultural barriers on their overall experience. In addition, mentorship can provide interns with supportive guidance to overcome such challenges. By addressing adaptability challenges, mentorship enables interns to develop meaningful, transferable skills and management know-how that can positively shape their overall entrepreneurial aspiration. Thus, the following hypothesis is formulated:

H2: Receiving mentorship, even if adaptability is a challenge, exerts a positive influence on entrepreneurial aspiration.

Furthermore, we find it useful to examine the relative importance of management factors compared to work environment factors in predicting entrepreneurial aspiration. While both factors are likely to be important, we expect that management factors exert greater influence on the outcome variable, as they directly shape individuals' learning outcomes and career trajectories. Work environment factors, on the other hand, are less likely to build individuals' skills directly but rather create the organizational structure or conditions that indirectly facilitate entrepreneurial aspiration. Generally, organizational culture or the overall team atmosphere primarily creates an enabling environment conducive to effective learning. Accordingly, the following hypothesis is formulated:

H3: Management factors explain a greater proportion of the variation in entrepreneurial aspiration than work environment factors.

4.2 Results

We estimate equation (1) using ordinary least squares (OLS) given the continuous nature of the dependent variable and report the results in Table 3, showing the impact of management and work environment factors on entrepreneurial aspiration. The table has five models. In Model 1, only management factors are included in the regression; in Model 2, only work environment factors are included. Model 3 combines both management and work environment factors in addition to internship duration. Model 4 extends Model 3 by introducing controls. In Model 5, the *response time* variable is introduced to address concerns relating to endogeneity (more on this later). The dependent variable across all specified models is entrepreneurial aspiration. In addition, all models are estimated using robust standard errors and cohort-year fixed effects.

Both management factors (task clarity and role-match) are found to positively influence entrepreneurial aspiration across Model 1, Model 3, and Model 4. Corroborating the findings of To and Lung (2020) and Hussien and Lopa (2018), this result suggests that ambiguity can be significantly reduced when tasks assigned to interns are clearly defined. Turning to work environment factors, only mentorship was consistently significant. The language barrier, however, was significant in only one specification—Model 2—while the adaptability challenge was not significant in any of the specifications. This indicates that interns who received mentorship, compared to those who did not, on average reported higher entrepreneurial aspiration after the program. This result echoes the findings observed by Mumford and Sechel (2019).

Interestingly, interns who experienced language difficulties have either higher or no entrepreneurial aspiration. While unexpected, this finding could be explained in several ways. For example, companies that offer internships may try to offset the burden of language difficulties by providing various ways to convey information, such as visual demonstrations or online translation tools. Another possible explanation could be that interns are likely expecting language difficulties when entering the program, and as a result, such difficulty is less likely to have any meaningful effect on entrepreneurial aspirations. This explanation is supported by models 3, 4 and 5, which shows no relationship between language difficulties and entrepreneurial aspirations once additional controls are included.

The results also indicate that, on average, each additional week of internship is associated with a 0.032- and 0.028-point increase in entrepreneurial aspiration in Model 3 and Model 4, respectively. Typically, spending more time in an internship allows participants to adapt to the

organizational environment and understand company-specific production processes, thereby acquiring more skills and experience than if their internship were shorter.

Interesting relationships also emerged between entrepreneurial aspiration and several control variables. For instance, greater entrepreneurial aspiration was observed among males, older participants, and individuals with prior experience with networking or leadership roles. Full results are presented in Appendix Table A6.

Endogeneity concerns

A potential source of endogeneity arises from self-selection into survey participation.. Individuals who responded to the survey may be disproportionately more likely to have stronger recollections of the program (either good or bad) than non-responders. As such, this could systematically bias the results. Unfortunately, because the outcome variable is only observed for survey respondents and there is limited to no information on non-respondents, correcting for this bias is challenging.

To address potential sample selection bias, a new variable (*response time*) was created by measuring the time each respondent took to complete the survey. The primary aim of this approach is to examine whether a systematic pattern in response timing exists and, if so, whether it significantly alters the main results. Here, a systematic pattern emerges in which certain types of participants respond earlier or later than others, in a way that is not random. For example, respondents with a strong and favorable memory of their program experience may be more enthusiastic about the survey and, hence, more inclined to respond quickly. In contrast, those with less favorable memories may be less enthusiastic, tending to delay or avoid responding. Alternatively, the reverse might hold: individuals with a less pleasant memory of the program might be more eager to express their displeasure and thus respond more quickly. In short, the *response time* variable is expected to measure how excited or displeased the person is about the program.

By testing whether the outcome variable varies across different response time groups, we can conjecture whether the estimated relationships remain stable. If adding this variable does not significantly change our results, it suggests that sample selection bias may not be a major concern. However, if the addition of this variable significantly alters our main results, then it might indicate the opposite.

The *response time* variable is measured as the time each respondent took to complete the survey, relative to the total time. The score is created by converting each respondent's timestamp to reflect the number of days since the earliest recorded submission. These time differences are then ranked into percentiles and scored from 1 (most delayed response) to 10 (earliest response). The percentile-based scaling is normalized to account for uneven response patterns (such as early spikes or gaps) by comparing each respondent's speed with others' (see Appendix 1 for additional details on how the response score is calculated).

Model 5 in Table 3 includes *response time* as a control variable. Comparison between models 4 and 5 indicates the inclusion of *response time* did not alter the results in any meaningful way, as there is relatively little change in the effect of *task clarity*, *role-match*, *mentorship*, *language barrier*, *adaptability challenge*, and *internship duration*.

Testable hypothesis

Results for the testable hypotheses discussed in Section 4.1 are presented in Table 4 and Table 5.[12] We report four sets of results (Model 1, Model 2, Model 3, and Model 4) in a stepwise manner in Table 4. Model 1 includes the interaction term between *TC* and *RM*, while Model 2 includes the interaction term between *Ment* and *Adap*. Model 3 includes both interaction terms in the same model. However, these models include no controls. Model 4 extends Model 3 by including language barrier, internship duration, and the full set of controls. It is important to note that all the models include cohort-year fixed effects.

Regarding management factors, task clarity and role-match do not independently exert a significant influence on entrepreneurial aspiration. However, the interaction term of task clarity and role-match is associated with higher entrepreneurial aspiration, and the effect is significant across all models. This suggests that when tasks are clearly defined, and roles align with expectations, interns are more likely to develop transferable skills during the internship, which, in turn, enhances their entrepreneurial aspirations (Maaravi et al., 2021). In addition to being significant, the interaction term coefficient is substantially larger in magnitude than the coefficients for either task clarity or role-match alone. These results indicate a complementary effect between task clarity and role-match, thereby providing strong support for H1.

[12] We additionally present results for other interaction terms in Appendix Table A7. The findings show that role-match and mentorship indeed exhibit a complementary relationship. Furthermore, mentorship and role-match play compensatory roles in mitigating language barriers and adaptability difficulties, respectively.

With respect to work environment factors, mentorship enhances entrepreneurial aspiration. The estimated coefficients are statistically significant across all the models and consistent with the study's expectations. Surprisingly, individuals who experienced adaptability challenges were more likely to have higher entrepreneurial aspiration after the program than those who did not. While this effect is observed across all models, the coefficient is significant only in Model 3 and Model 4.

However, individuals who experienced both mentorship and adaptability challenges, compared with those who did not, were, on average, more likely to report higher entrepreneurial aspiration. This positive association is consistent and highly significant across all models, indicating that mentorship can strengthen entrepreneurial aspiration even in the face of cross-cultural challenges. Importantly, the results suggest that mentorship plays a compensatory role by offsetting potentially negative effects arising from difficulties with adaptability. Consequently, the findings provide support for H2.

In Table 5, bootstrapping was used to determine which factor—management or work environment—is more important in explaining entrepreneurial aspiration. We begin by estimating Model 1, which includes only management factors, and then collect the *R*-squared from this regression. We then do the same procedure for Model 2, which includes only work environment factors. The difference between these two *R*-squared values indicates the relative importance of each group in determining entrepreneurial aspiration. A positive difference suggests work environment factors are more important. We then re-estimated each regression by randomly resampling our dataset 1,000 times with replacement, yielding 1,000 estimates of Δ *R*-squared. We use this distribution to calculate a confidence interval on this parameter.

We report two sets of results from this process: Test 1 and Test 2. Test 1 shows results for models estimated without control variables, while Test 2 shows results for models that include control variables. In Test 1, results show no meaningful difference between the two sets of factors. In contrast, the inclusion of controls in Test 2 shows a statistically significant difference between the two factors. These results show that the management factor model explained about 15% more variation in entrepreneurial aspiration than the work environment factor model. This finding supports the expectation that management factors play a stronger role in cultivating entrepreneurial aspiration than general work environment conditions, thus providing partial support for H3.

Robustness check

As a robustness check, we use three alternative measures of entrepreneurial aspiration and then re-estimate our baseline models to see how this impacts our results. Unlike the baseline specification, these models are estimated using an ordered logit framework, which is appropriate when the dependent variable is ordinal rather than continuous. The ordered logit model preserves rank-order information and allows for greater variation in estimation compared to binary response models such as probit or logit.

Table 6 reports the results for three model specifications. In the first, the entrepreneurial aspiration index is transformed into five ordered categories to make it compatible with the ordered logit structure. The second and third specifications decompose the composite measure into its underlying ordinal indicators.[13] Specifically, the second specification focuses on *entrepreneurial consideration* (defined as the decision to become an entrepreneur or consider engaging in entrepreneurship), while the third captures *collaboration* (defined as the decision to build strong ties for future business collaboration with Japanese companies).

In the first model specification, the results show that task clarity, role-match, mentorship, and internship duration had significant positive effects on entrepreneurial aspiration, whereas the language barrier and adaptability challenge were insignificant. The finding is consistent with the main results reported in Table 3, thereby confirming the robustness of our result. A similar observation emerged in the second specification, in which entrepreneurial aspiration is measured using *entrepreneurial consideration*. The third specification found that task clarity and internship duration were the only statistically significant predictors of entrepreneurial aspiration when the dependent variable was defined as *collaboration*. The estimation using disaggregated ordinal indicators as dependent variables clearly shows that individuals respond differently to entrepreneurial consideration and strategic collaboration based on their internship experiences.

Furthermore, given the close association among the decomposed indicators, we also conducted an internal consistency check across the survey responses. In other words, we identified and excluded cases where respondents provided extremely contradictory ratings across the two

[13] This decomposition adds depth to our analysis by revealing the specific pathways through which entrepreneurial aspirations are formed. Overall, however, comparing OLS results with those from ordered logit can serve as a robustness check, ensuring the conclusions drawn are not dependent on the choice of estimation method.

measures. For example, if a respondent rated the internship as strongly influential on entrepreneurial consideration (=5) but collaboration as not at all influential (=1), or vice versa, the observation was dropped. This process resulted in the exclusion of seven observations, reducing the sample to 313. We present this result in Table 7, showing four specifications across two estimation techniques (OLS and ordered logit). While the first specification reports the OLS result, the second through fourth specifications report results for the ordered logit models. In terms of sign and significance, the results remained robust and consistent, reinforcing the reliability of the study's findings.

Limitations

Like many other studies, this study is not exempt from limitations. As such, we want to draw attention to three key issues. The first concerns the trade-off between the number of fixed effects and sample size. Normally, the ideal approach is to include a robust set of fixed effects that control for a participant's cohort-year (the year the participant studied in Japan) and the participant's country of origin. However, with a sample size of 320, it is difficult to include so many controls. Specifically, the sample has representation from 48 countries, 70 universities, and 10 cohort years. Including fixed effects for each of these categories would require us to estimate 146 coefficients (125 fixed-effect coefficients, 20 covariate coefficients, and an intercept). This can seriously reduce our model's statistical power, making it difficult to detect statistical significance even when a strong relationship exists (Angrist and Pischke, 2009; Baltagi, 2008).

Hence, balancing the need for controls while considering the limits of the sample, we decided to only use cohort-year fixed effects for two reasons: (1) cohort-year is the smallest fixed-effect group, with only 10 unique entries; and (2) cohort-year effects are likely to capture important changes in the program over time that may relate to shifts in JICA policy, and changes in the economic or institutional environment that could systematically affect training outcomes across cohorts.[14] However, to compensate for the absence of origin-country fixed effects, we included a measure of each respondent's country of origin's level of development. We considered variations in development levels to reflect broader structural differences in terms of economic conditions, institutional capacity, and human capital development across countries. As such,

[14] During the COVID-19 pandemic, for instance, JICA adapted by moving internships to a remote format to meet social distancing requirements, while travel restrictions prevented new students from entering Japan, requiring them to start the program online from their home countries.

this measure serves as a reasonable proxy accounting for country heterogeneity among participants.

The second limitation pertains to the size and industry of the companies where participants completed their internships. According to the list of host companies provided by JICA, ABEI scholars have access to a diverse range of potential internship opportunities. We directly asked survey takers to provide information about their host company (e.g., its size and industry). However, many participants either did not know or could not recall specific details, leading to a large share of 'I do not know' responses (almost half of the sample). The lack of reliable data on company characteristics led to the omission of these variables from the empirical strategy, despite their potential importance as sources of variation.

The third limitation concerns the assessment of entrepreneurial aspiration, which reflects intentions or desires rather than actual outcomes. While performance often begins with desire and intention, aspirations do not necessarily translate into realized entrepreneurial activity. As such, analysis of ABEI's impact on scholars' actual entrepreneurial behavior remains a limitation that deserves consideration in future research.

The fourth limitation relates to endogeneity. Although we incorporated a response time measure to assess potential selection bias, we cannot be fully rule out endogeneity without a credible instrument. Unobserved characteristics—such as pre-existing entrepreneurial traits—may jointly determine both program engagement (like opting into longer internships) and entrepreneurial intentions. Therefore, the estimated coefficients should be interpreted as robust conditional associations rather than strict causal effects.

5.0 Conclusion

Drawing on insights from ABEI scholars, this study examines the impact of management and work environment factors on entrepreneurial aspiration. In the baseline model, task clarity, role-match, mentorship, and internship duration were consistently and significantly associated with higher levels of entrepreneurial aspiration. Under certain conditions, the language barrier was surprisingly found to have a positive effect on entrepreneurial aspiration. In contrast, the adaptability challenge did not have a meaningful effect on any of the baseline models. Analysis using interaction terms revealed noteworthy associations. Together, task clarity and role-match exerted a greater impact on entrepreneurial aspiration than either factor alone, highlighting their complementarity relationship. In addition, mentorship appeared to play a compensatory

role by offsetting any potentially negative effect of adaptability challenge on entrepreneurial aspiration. The bootstrapping comparison confirmed that management factors exert a stronger influence on entrepreneurial aspiration than work environment factors.

By establishing the conditions and mechanisms through which job training cultivates entrepreneurship, this study contributes to the broader discussion on human capital development within the developing world. Considering that Africa has the world's youngest population (Adebisi et al., 2024) and continues to face employment challenges (United Nations Economic Commission for Africa, 2024), the findings from this study carry important policy implications.

Investment in entrepreneurial capacity and learning from the experiences of successfully industrialized nations has been identified as a key development strategy for encouraging innovation and industrialization (Otsuka, 2024; McKenzie et al., 2023). This has been demonstrated historically by the development of East Asian countries such as Japan, South Korea, Taiwan, and China, which successfully industrialized by selectively importing technologies and production systems from more advanced economies and adapting them to their factor endowments (Hashino and Otsuka, 2026, forthcoming). Aligning with this historical model, the ABEI program, by design, attempts to lay the foundation for executing a similar strategy. By providing international exposure and work-based learning experiences, ABEI scholars could be equipped with the transformative skills, networks, and capabilities essential to fostering industrialization through innovation-driven entrepreneurship.

Thus, providing and expanding access to structured job-training programs, such as the ABEI, can serve as catalysts for developing entrepreneurial leaders capable of accelerating Africa's industrial growth. As we show in this study, such programs nurture the entrepreneurial mindset needed for innovation. Therefore, investing in the entrepreneurial capacity of young skilled individuals could expand employment opportunities and contribute to the continent's economic transformation. Accordingly, effectively designing and scaling up such programs should not merely be regarded as an educational investment but as a strategic industrial policy.

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Table 1. Distribution of Entrepreneurial Aspiration Based on Management and Work Environment Factors

Factors	Share of sample size (%)	Entrepreneurial aspiration (% share of respondents)				
		Not at all influential	Not influential	Neutral	Influential	Greatly Influential
Management factors						
Task clarity						
Clear	93.1	11.4	15.5	21.8	32.2	19.1
Unclear	6.9	9.1	31.8	45.5	13.6	0.0
Role-match						
Match	76.6	9.8	15.5	23.7	30.6	20.4
No match	23.4	16.0	20.0	22.7	32.0	9.3
Work environment factors						
Mentorship						
Receive	93.7	10.3	16.0	22.7	32.7	18.3
Did not receive	6.3	25.0	25.0	35.0	5.0	10.0
Language barrier						
Experienced	45.9	6.8	16.3	25.2	37.4	14.3
Did not experience	54.1	15.0	16.8	22.0	25.4	20.8
Adaptability challenge						
Experienced	18.4	8.5	16.9	25.4	33.9	15.3
Did not experience	81.6	11.9	16.50	23.0	30.2	18.4
Total	100.0					

Entrepreneurial aspiration is a composite measure constructed by averaging two underlying constructs (see Section 3.1). This transformed measure produces a variable that is approximately continuous. However, to facilitate interpretation, the composite measure is mapped into an ordinal scale as follows: 1–1.5 = Not at all influential; 2–2.5 = Not influential; 3–3.5 = Neutral; 4–4.5 = Influential; > 4.5 = Greatly influential.

Table 2. Distribution of Entrepreneurial Aspiration by Respondents' Characteristics

Indicators	Share of sample (%)	Entrepreneurial aspiration (% share of respondents)				
		Not at all influential	Not influential	Neutral	Influential	Greatly Influential
Respondent (%)		11.3	16.6	23.4	30.9	17.8
Sex						
Male	73.1	9.0	15.4	21.8	34.2	19.7
Female	26.9	17.4	19.8	27.9	22.1	12.8
Age group						
20–24	0.6	50.0	0.0	50.0	0.0	0.0
25–29	7.8	36.0	16.0	28.0	8.0	12.0
30–34	27.5	9.1	22.7	25.0	26.1	17.1
35–39	34.7	8.1	19.8	17.1	35.2	19.8
40–44	19.7	7.9	9.5	31.8	33.3	17.5
45+	9.7	12.9	3.2	19.4	45.1	19.4
Field of study during ABEI:						
Business and Management	23.1	5.4	13.5	25.7	39.2	16.2
Health and Medical Sciences	5.3	17.6	11.8	41.2	17.6	11.8
Humanities and Education	1.6	60.0	20.0	20.0	0.0	0.0
STEM	52.8	11.8	16.0	20.1	31.4	20.7
Social Sciences	17.2	10.9	23.6	25.5	25.5	14.5

Entrepreneurial aspiration is a composite measure constructed by averaging two underlying constructs (see Section 3.1). This transformed measure produces a variable that is approximately continuous. However, to facilitate interpretation, the composite measure is mapped into an ordinal scale as follows: 1–1.5 = Not at all influential; 2–2.5 = Not influential; 3–3.5 = Neutral; 4–4.5 = Influential; > 4.5 = Greatly influential.

Table 3. The Impact of Management and Work Environment Factors on Entrepreneurial Aspiration

Dependent Variable (Entrepreneurial aspiration)	Model 1	Model 2	Model 3	Model 4	Model 5
Management Factors					
Task clarity	0.612***		0.462**	0.469*	0.452*
	(0.211)		(0.226)	(0.240)	(0.239)
Role-match	0.339**		0.389**	0.326**	0.330**
	(0.176)		(0.167)	(0.165)	(0.162)
Work Environment Factors					
Mentorship		0.953***	0.687**	0.662**	0.686**
		(0.298)	(0.314)	(0.282)	(0.277)
Language barrier		0.311**	0.187	0.106	0.109
		(0.143)	(0.143)	(0.142)	(0.140)
Adaptability challenge		0.060	0.102	0.121	0.121
		(0.177)	(0.177)	(0.171)	(0.165)
Internship duration (in weeks)			0.032***	0.028***	0.029***
			(0.007)	(0.008)	(0.008)
Response time					−0.064***
					(0.024)
Constant	2.617***	2.399***	1.633***	−0.253	−0.070
	(0.216)	(0.310)	(0.313)	(0.600)	
Observations	320	320	320	320	320
Controls	No	No	No	Yes	Yes
Cohort-year FE	Yes	Yes	Yes	Yes	Yes

*, **, and *** represent significance at the 10%, 5%, and 1% level, respectively. After controlling for other factors, the coefficients for management and work environment factors indicate a difference in the mean, whereas those for internship duration indicate a marginal effect. Robust standard errors are in parentheses, and models were estimated using OLS. Each model includes cohort-year fixed effect and observable individual characteristics such as sex, age, pre-ABEI employment, field of study during ABEI, prior experience, motivation, development level of respondents' country of origin, and ABEI exposure.

Table 4. Interaction Effect of Management and Work Environment Factors on Entrepreneurial Aspiration

Dependent Variable (Entrepreneurial aspiration)	Model 1	Model 2	Model 3	Model 4
Management Factors				
Task clarity	0.439 (0.356)		0.438 (0.375)	0.316 (0.320)
Role-match	0.021 (0.362)		0.062 (0.406)	−0.086
				(0.422)
Task clarity × Role-match	0.814**		0.812**	0.702**
	(0.319)		(0.360)	(0.323)
Work Environment Factors				
Mentorship		1.112***	0.972**	0.927***
		(0.380)	(0.384)	(0.326)
Adaptability challenge		0.678 (0.482)	1.165** (0.490)	0.941**
				(0.453)
Mentorship × Adaptability challenge		1.206***	1.1142***	0.958***
		(0.408)	(0.403)	(0.357)
Language barrier				0.117 (0.326)
Internship duration (in weeks)				0.027***
				0.008
Constant	2.762***	2.376***	1.180***	−0.275
	(0.308)	(0.372)	(0.444)	(0.655)
Observations	320	320	320	320
Controls	No	No	No	Yes
Cohort-year FE	Yes	Yes	Yes	Yes

*, **, and *** represent significance at the 10%, 5%, and 1% level, respectively. After controlling for other factors, the coefficients for management and work environment factors indicate a difference in the mean, whereas that for internship duration indicates a marginal effect. Robust standard errors are reported in parentheses, and models were estimated using OLS. Model 1, Model 2, and Model 3 do not include controls, while Model 4 does. All models include cohort-year fixed effects. Observable individual characteristics include sex, age, pre-ABEI employment, field of study during ABEI, prior experience, motivation, development level of respondents' country of origin, and ABEI exposure.

Table 5. Bootstrapping Comparison of R^2 Between Management Factors Versus Work Environment Factors

	Test 1	Test 2
ΔR^2	0.003 (0.026)	-0.146^{***} (0.042)
Controls	No	Yes

*, **, and *** represent significance at the 10%, 5%, and 1% level, respectively. ΔR^2 is the mean difference in explanatory power (R^2) between the model including work environment factors and the model including management factors. Values in parentheses represent bootstrap standard errors based on 1,000 replications for 320 sample observations. Models in Test 1 exclude controls, while models in Test 2 include controls (including internship duration) to evaluate the separate explanatory effects of the two factor groups. It is important to note that 139 iterations were dropped during Test 2 due to a lack of variation in the bootstrap sample.

Table 6. Robustness Checks using Alternative Measures of Entrepreneurial Aspiration

	Ordered Logit Model		
	Entrepreneurial aspiration (ordinal)	Entrepreneurial consideration	Collaboration
Management Factors			
Task clarity	0.921** (0.398)	0.804** (0.373)	1.107** (0.450)
Role-match	0.550* (0.296)	0.512* (0.281)	0.474 (0.308)
Work Environment Factors			
Mentorship	1.138** (0.409)	1.434*** (0.535)	0.597 (0.560)
Language barrier	−0.071 (0.238)	0.125 (0.255)	0.0156 (0.242)
Adaptability challenge	0.194 (0.294)	0.0851 (0.291)	0.383 (0.323)
Internship duration (in weeks)	0.057*** (0.047)	0.054*** (0.015)	0.039*** (0.013)
Observations	320	320	320
Controls	Yes	Yes	Yes
Cohort-year FE	Yes	Yes	Yes

*, **, and *** represent significance at the 10%, 5%, and 1% level, respectively. Reported coefficients indicate a change in log-odds, and values in parentheses represent robust standard errors. Each model includes cohort-year fixed effects and observable individual characteristics such as sex, age, pre-ABEI employment, field of study during ABEI, prior experience, motivation, respondents' country of origin's development level, and ABEI exposure. The column headers for columns 2, 3, and 4 indicate the dependent variables. Entrepreneurial aspiration (ordinal) in column 2 is the average score transformed into a five-point ordinal scale (≤1.5 is registered as 1; >1.5 but ≤2.5 is registered as 2; > 2.5 but ≤3.5 is registered as 3; >3.5 but ≤4.5 is registered as 4; and >4.5 is registered as 5). Entrepreneurial consideration and collaboration represent the decomposition of the entrepreneurial aspiration into the two ordinal constructs from which it is generated.

Table 7. Internal Consistency Robustness Check

	OLS	**Ordered Logit**		
	Entrepreneurial aspiration	Entrepreneurial aspiration (ordinal)	Entrepreneurial consideration	Collaboration
Management Factors				
Task clarity	0.472* (0.243)	0.895** (0.399)	0.876** (0.395)	1.089** (0.453)
Role-match	0.330* (0.169)	0.552* (0.299)	0.483* (0.291)	0.529* (0.305)
Work Environment Factors				
Mentorship	0.658** (0.298)	1.117** (0.515)	1.329** (0.555)	0.731 (0.551)
Language barrier	0.109 (0.146)	−0.0850 (0.242)	0.115 (0.258)	0.0314 (0.245)
Adaptability challenge	0.119 (0.176)	0.194 (0.299)	0.114 (0.298)	0.354 (0.324)
Internship duration (in weeks)	0.028***	0.057***	0.055***	0.042***
	(0.008)	(0.015)	(0.015)	(0.013)
Observations	313	313	313	313
Controls	Yes	Yes	Yes	Yes
Cohort-year FE	Yes	Yes	Yes	Yes

*, **, and *** represent significance at the 10%, 5%, and 1% level, respectively. Each model includes cohort-year fixed effects and observable individual characteristics such as sex, age, pre-ABEI employment, field of study during ABEI, prior experience, motivation, respondents' country of origin's development level, and ABEI exposure. The column headers for columns 2–5 indicate the dependent variables. Coefficients were defined as in the previous table, where models were adopted.

Figure 1. Number of ABEI Participants Across Cohorts.

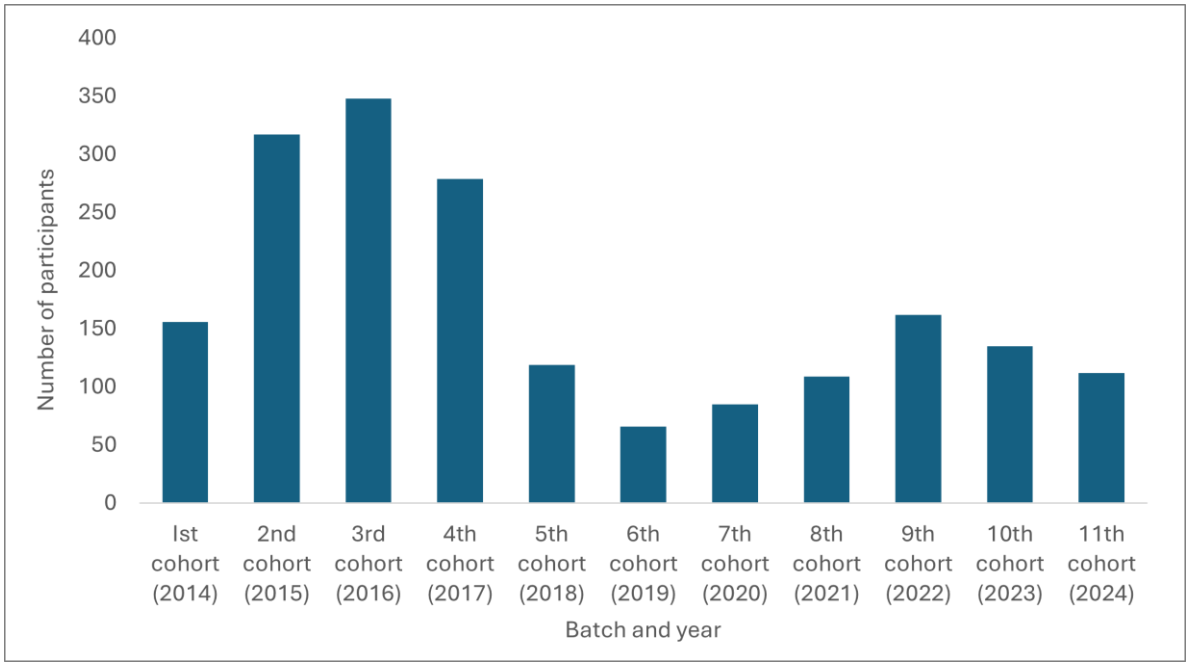
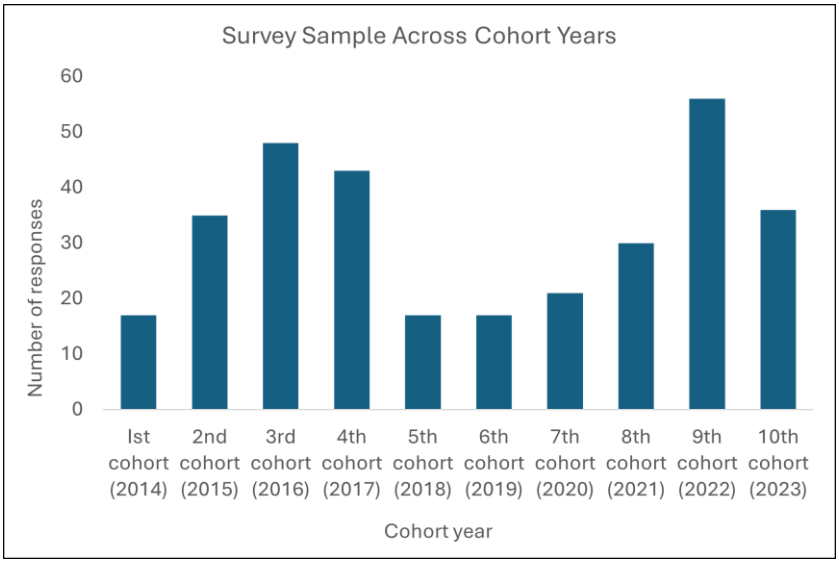
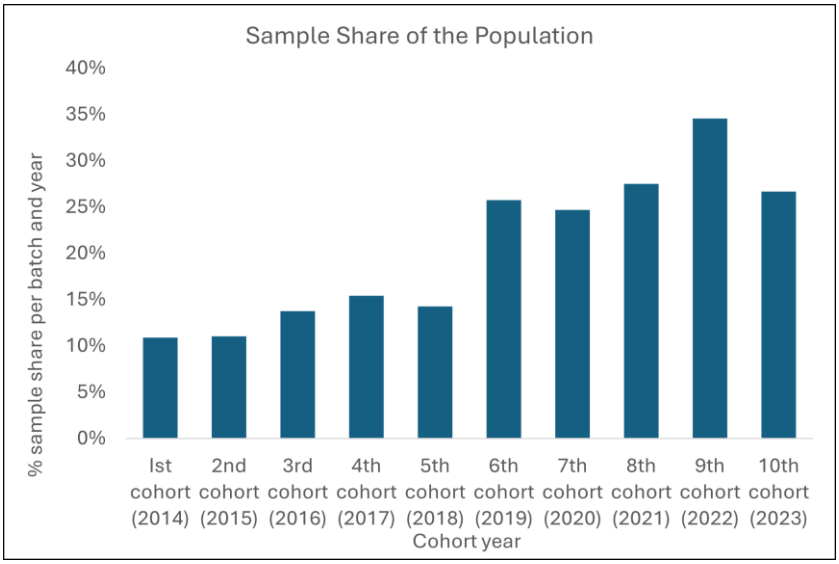


Figure notes: this graph was generated using data provided by Japan International Cooperation Agency.

Figure 2. Distribution of Survey Responses (top) and Sample Share (bottom) of the Population Across Cohorts



Panel A



Panel B

Figure notes: Panel A graph was generated exclusively from the survey data; Panel B graph was generated using both survey and Japan International Cooperation Agency cohort data.

APPENDIX

Appendix 1. Response Time Formula

Time difference calculation (measured in days)

$$Time\ difference_i = Timestamp_i - FirstTimestamp \tag{a1}$$

Percentile rank

$$Percentile_i = \frac{Number\ of\ respondents\ with\ Timedifference < Time\ difference_i}{N-1} \tag{a2}$$

where: N is the total number of survey respondents.

Equation (3) ranks respondents, with late respondents in the lower percentiles and early respondents in the top percentile. This calculation can also be easily done using the PERCENTRANK.INC functions in Excel.

Response time

$$Response\ score_i = 1 + (Percentile_i \times 9) \tag{a3}$$

Here, a score of 1 indicates a late response, and 10 indicates an early response.

Appendix Table A1. Distribution of Entrepreneurial Aspiration (Measured as Entrepreneurial Consideration) Based on the Management and Work Environment Factors

Factors	Share of sample size (%)	Entrepreneurial consideration (% share of respondents)				
		Not at all influential	Not influential	Neutral	Influential	Greatly Influential
Respondent (%)		18.4%	11.6%	22.2%	25.0%	22.8%
Management factors						
Task Clarity						
Clear	93.1%	18.8%	10.4%	20.5%	25.8%	24.5%
Unclear	6.9%	18.2%	22.7%	45.5%	13.6%	0.0%
Role-match						
Match	76.6%	16.7%	11.0%	22.0%	24.5%	25.7%
No match	23.4%	24.0%	13.3%	22.7%	26.7%	13.3%
Work environment factors						
Mentorship						
Receive	93.7%	16.3%	12.0%	21.6%	26.3%	23.7%
Did not receive	6.3%	50.0%	5.0%	30.0%	5.0%	10.0%
Language barrier						
Experienced	45.9%	12.9%	10.0%	25.9%	29.3%	21.8%
Did not experience	54.1%	23.1%	12.7%	19.1%	21.4%	23.7%
Adaptability challenge						
Experienced	18.4%	13.6%	17.0%	23.7%	25.4%	20.3%
Did not experience	81.6%	19.5%	10.3%	21.8%	24.9%	23.7%

Entrepreneurial consideration (defined as the decision to become an entrepreneur or consider engaging in entrepreneurship) represents one of the decomposed constructs used to measure entrepreneurial aspiration. It is an ordinal variable converted into a five-point scale (1 = Not at all influential; 2 = Not influential; 3 = Neutral; 4 = Influential; and 5 = Greatly influential).

Appendix Table A2. Distribution of Entrepreneurial Aspiration (Measured as Collaboration) Based on Management and Work Environment Factors

Factors	Share of sample size (%)	Collaboration (% share of respondents)				
		Not at all influential	Not influential	Neutral	Influential	Greatly Influential
Respondent (%)		8.8	10.0	17.8	32.2	31.3
Management factors						
Task clarity						
Clear	93.1	8.7	9.4	17.1	31.2	33.6
Unclear	6.9	9.1	18.2	27.3	45.4	0.0
Role-match						
Match	76.6	6.9	9.4	18.8	30.6	34.3
No match	23.4	14.7	12.0	14.7	37.3	21.3
Work environment factors						
Mentorship						
Receive	93.7	8.0	10.3	17.3	32.0	32.3
Did not receive	6.3	20.0	5.0	25.0	35.0	15.0
Language barrier						
Experienced	45.9	4.1	10.9	17.0	39.5	28.6
Did not experience	54.1	12.7	9.3	18.5	26.0	33.5
Adaptability *c*hallenge						
Experienced	18.4	6.8	10.2	11.9	42.4	28.8
Did not experience	81.6	9.2	10.0	19.2	29.9	31.8

Collaboration (defined as the decision to build strong ties for future business collaboration with Japanese companies) represents one of the decomposed constructs used to measure entrepreneurial aspiration. It is an ordinal variable converted to a five-point scale (1 = Not at all influential; 2 = Not influential; 3 = Neutral; 4 = Influential; and 5 = Greatly influential).

Appendix Table A3. Distribution of Entrepreneurial Aspiration (Measured as Entrepreneurial Consideration) by Respondents' Characteristics

Indicators	Share of sample (%)	Entrepreneurial consideration (% share of respondents)				
		Not at all influential	Not influential	Neutral	Influential	Greatly Influential
Sex						
Male	73.1	14.5	11.1	21.4	28.2	24.8
Female	26.9	29.1	12.8	24.4	16.3	17.4
Age group						
20–24	0.6	50.0	0.0	0.0	50.0	0.0
25–29	7.8	48.0	12.0	24.0	0.0	16.0
30–34	27.5	20.5	14.8	22.7	20.5	21.6
35–39	34.7	17.1	13.5	18.9	24.3	26.1
40–44	19.7	9.5	6.4	28.6	33.3	22.2
45+	9.7	9.7	6.5	19.4	41.9	22.6
Field of study during ABEI						
Business and Management	23.1	16.2	8.1	20.3	32.4	23.0
Health and Medical Sciences	5.3	17.7	17.7	29.4	23.5	11.8
Humanities and Education	1.6	80.0	0.0	20.0	0.0	0.0
STEM	52.8	17.8	11.8	20.2	22.5	27.2
Social Sciences	17.2	18.2	14.6	27.3	25.5	14.6

Note that entrepreneurial consideration (defined as the decision to become an entrepreneur or to consider entrepreneurship) is one of the decomposed constructs used to measure entrepreneurial aspiration. It is an ordinal variable converted to a five-point scale (1 = Not at all influential; 2 = Not influential; 3 = Neutral; 4 = Influential; and 5 = Greatly influential).

Appendix Table A4. Distribution of Entrepreneurial Aspiration (Measured as Collaboration) by Respondents' Characteristics

Indicators	Share of sample (%)	Collaboration (% share of respondents)				
		Not at all influential	Not influential	Neutral	Influential	Greatly Influential
Sex						
Male	73.1	14.5	11.1	21.4	28.2	24.8
Female	26.9	29.1	12.8	24.4	16.3	17.4
Age group						
20–24	0.6	50.0	0.0	0.0	50.0	0.0
25–29	7.8	48.0	12.0	24.0	0.0	16.0
30–34	27.5	20.5	14.8	22.7	20.5	21.6
35–39	34.7	17.1	13.5	18.9	24.3	26.1
40–44	19.7	9.5	6.4	28.6	33.3	22.2
45+	9.7	9.7	6.5	19.4	41.9	22.6
Field of study during ABEI						
Business and Management	23.1	16.2	8.1	20.3	32.4	23.0
Health and Medical Sciences	5.3	17.6	17.6	29.4	23.5	11.8
Humanities and Education	1.6	80.0	0.0	20.0	0.0	0.0
STEM	52.8	17.8	11.8	20.7	22.5	27.2
Social Sciences	17.2	18.2	14.6	27.3	25.5	14.6

Collaboration (defined as the decision to build strong ties for future business collaboration with Japanese companies) represents one of the decomposed constructs used to measure entrepreneurial aspiration. It is an ordinal variable converted to a five-point scale (1 = Not at all influential; 2 = Not influential; 3 = Neutral; 4 = Influential; and 5 = Greatly influential).

Appendix Table A5. Variable Definitions

Variable	Type	Definition
Entrepreneurial aspiration	Continuous	This is an average score generated from two ordinal constructs measured on a 5-point ordinal scale, ranging from 'Greatly influential' to 'Not at all influential'. Respondents were asked to what extent the internship influenced (1) their decision to become an entrepreneur (or consider engaging in entrepreneurship); and (2) their decision to build strong ties for future business collaboration with Japanese companies.
Internship-related factors		
Task clarity	Binary	Task clarity represents whether tasks were communicated clearly to the interns. It is a binary variable coded as 1(yes) if the tasks assigned during the internship were clear, and 0 (no) otherwise.
Role-match	Binary	Role-match captures whether the respondent's assigned internship role aligned with their expectations or career interests. It is a binary variable coded as 1 (yes) if the internship role matched their expectations, and 0 (no) otherwise.
Mentorship	Binary	Mentorship refers to whether the respondent received guidance or mentorship during their internship. It is a binary variable coded as 1 (yes) if mentorship or guidance was provided, and 0 (no) otherwise.
Language barrier	Binary	The language barrier is a binary variable coded as 1 (yes) if the respondent reported experiencing a language barrier during the internship, and 0 (no) otherwise.
Adaptability challenge	Binary	The adaptability challenge reflects whether the respondent experienced difficulty adapting to the internship environment. It is a binary variable coded as 1 (yes) if the respondent experienced adaptation challenges, and 0 (no) otherwise.
Controls		
Sex	Binary	This variable captures the respondent's sex. It is a binary categorical variable coded as: 1 = Female 2 = Male This variable is included to examine sex-based differences in entrepreneurial aspiration.
Age group	Categorical	This variable captures the respondent's age as a six-category ordinal variable, coded based on the following age brackets: 1 = 20–24 years 2 = 25–29 years 3 = 30–34 years 4 = 35–39 years 5 = 40–44 years 6 = 45 years and above
Pre-ABEI employment	Categorical	This variable indicates the respondent's main employment status immediately before participating in the ABE Initiative. It is a categorical variable with three categories: 1 = Employed 2 = Student 3 = Unemployed The variable captures the respondent's labour market engagement at program entry, which may influence their internship experience and entrepreneurial aspiration.

Variable	Type	Definition
Field of study during ABEI	Categorical	This variable categorizes the respondent's academic discipline during their participation in the ABE Initiative. It is a categorical variable comprising the following fields: 1 = Business and Management 2 = Health and Medical Sciences 3 = Humanities and Education 4 = STEM (Science, Technology, Engineering, and Mathematics) 5 = Social Sciences
Internship duration (per week)	Continuous	Internship duration measures the length (in weeks) that interns spent at the host company during their internship(s).
Country development	Categorical	This variable serves as a proxy for country fixed effect to minimize loss of variation in a relatively small sample. It captures the income classification of the respondent's country of origin based on World Bank groupings. The variable is coded as follows: 1 = Low income 2 = Lower middle income 3 = Upper middle income By using this variable instead of the full country's fixed effect, the model retains more statistical power while still accounting for institutional and contextual differences across countries.
Prior experience	Continuous	This variable is a continuous measure representing the respondent's self-assessed interpersonal capacity before joining the ABE Initiative. It is constructed by averaging the scores for two components: leadership skill level and networking skill level. Both components were measured before the start of the program on a five-point ordinal scale from very high to very low, and the resulting composite variable reflects the respondent's baseline social capital, which may influence how they navigate internship environments and extract value from them.
Motivation	Binary	This variable indicates whether the respondent was motivated to improve their social skills before starting the ABE Initiative. It is a binary indicator coded as: 1 = Yes, the respondent was motivated to build social skills 0 = No, the respondent was not motivated This variable captures initial mindset and intent, which may influence how respondents engage with internships and networking opportunities.
ABE Exposure	Continuous	ABE exposure is measured as the number of participants per country-cohort, serving as a proxy for the program's reach and intensity in each location.

Appendix Table A6. The Impact of Management and Work Environment Factors on Entrepreneurial Aspiration

Dependent Variable (Entrepreneurial Aspiration)	Model 1	Model 2	Model 3	Model 4
Management Factors				
Task Clarity	0.612*** (0.211)		0.462** (0.226)	0.469* (0.240)
Role-Match	0.339** (0.176)		0.389** (0.167)	0.326** (0.165)
Work Environment Factors				
Mentorship		0.953*** (0.298)	0.687** (0.314)	0.662** (0.282)
Language barrier		0.311** (0.143)	0.187 (0.143)	0.106 (0.142)
Adaptability challenge		0.060 (0.177)	0.102 (0.177)	0.121 (0.171)
Internship duration (in weeks)			0.032*** (0.007)	0.028*** (0.008)
Controls				
Sex				0.276* (0.162)
Age group (20–24)				
25–29				0.423 (0.468)
30–34				1.255** (0.404)
35–39				1.424** (0.416)
40–44				1.399** (0.428)
45+				1.973** (0.479)
Pre-ABEI employment (Employed)				
Student				0.167 (0.307)
Unemployed				0.243 (0.254)
Field of study during ABEI (Business and Management):				
Health and Medical Sciences				–0.124 (0.302)
Humanities and Education				–1.047* (0.625)
STEM				–0.070 (0.158)
Social Sciences				–0.316 (0.205)
Prior experience				0.210** (0.090)
Motivation				0.012 (0.179)
Country development (Low income):				
Lower middle income				–0.325** (0.153)
Upper middle income				–0.302 (0.223)
ABEI exposure				0.036 (0.027)
Constant	2.617*** (0.216)	2.399*** (0.310)	1.633*** (0.313)	–0.253 (0.600)
Observations	320	320	320	320
Controls	No	No	No	Yes
Cohort-year FE	Yes	Yes	Yes	Yes

*, **, and *** represent coefficient significance at the 10%, 5%, and 1% level, respectively. After controlling for other factors, the coefficients for management and work environment factors indicate differences in means, whereas that for internship duration indicates a marginal effect. Robust standard errors are in parentheses, and models were estimated using OLS. Each model includes cohort-year fixed effect and observable individual characteristics, such as sex, age, pre-ABEI employment, field of study during ABEI, prior experience, motivation, development level of respondents' country of origin, and ABEI exposure.

Appendix Table A7. Additional Interaction Term Results

Dependent Variable (Entrepreneurial aspiration)	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Role-match and Mentorship						
Role-match	0.311	0.110				
	(0.558)	(0.459)				
Mentorship	0.812**	0.669**				
	(0.385)	(0.334)				
Role-match x Mentorship	1.149***	1.016***				
	(0.354)	(0.309)				
Mentorship and Language						
Language barrier			0.220	0.027		
			(0.549)	(0.454)		
Mentorship			0.896**	0.861**		
			(0.454)	(0.402)		
Language barrier x Mentorship			1.224***	0.959**		
			(0.454)	(0.407)		
Role-match and Adaptability						
Role-match					0.459**	0.368**
					(0.206)	(0.185)
Adaptability challenge					0.238	−0.060
					(0.309)	(0.279)
Role-match x Adaptability challenge					0.586**	0.466*
					(0.279)	(0.253)
Internship duration (in weeks)		0.030***		0.027***		0.030***
		(0.007)		(0.007)		(0.007)
Constant	2.428***	0.249	2.459***	0.417	3.065***	0.626
	(0.346)	(0.554)	(0.443)	(0.592)	(0.188)	(0.695)
Observations	320	320	320	320	320	320
Controls	No	Yes	No	Yes	No	Yes
Cohort-year FE	Yes	Yes	Yes	Yes	Yes	Yes

*, **, and *** represent significance at the 10%, 5%, and 1% level, respectively. After controlling for other factors, the coefficients for management and work environment factors indicate differences in means, whereas that for internship duration indicates a marginal effect. Robust standard errors were in parentheses, and models were estimated using OLS. Models were estimated with and without control variables in certain specifications. Observable individual characteristics include sex, age, pre-ABEI employment, field of study during ABEI, prior experience, motivation, development level of respondents' country of origin, and ABEI exposure.

Appendix Figure A1. Distribution of Sample by Country

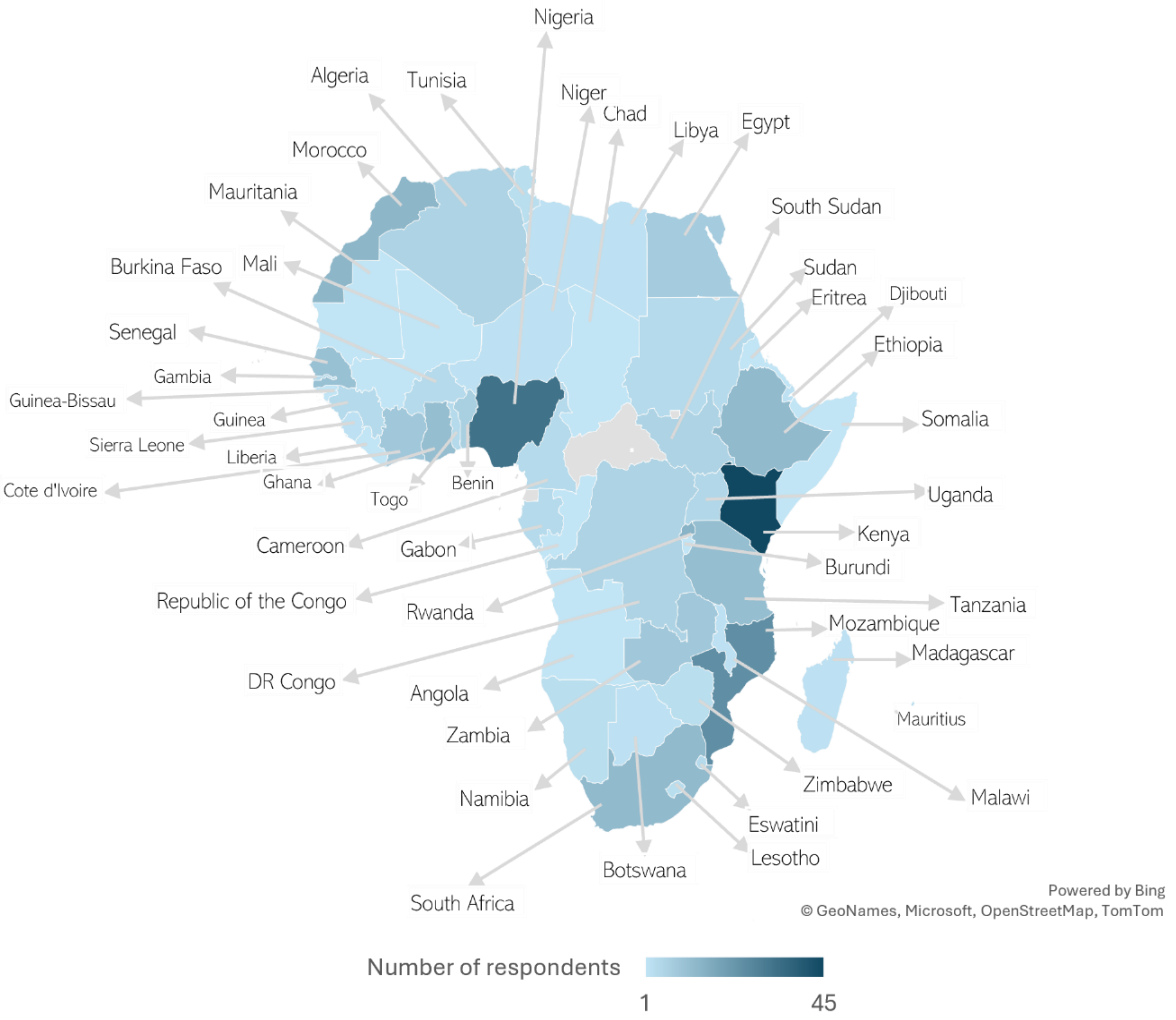


Figure notes: The diagram was generated from the survey data. The darker the blue, the more responses from that country. Grey areas indicate that no response emerged from that country. In total, responses were generated from 48 (out of 54) African countries.

Appendix Figure A2. Breakdown of Study Fields

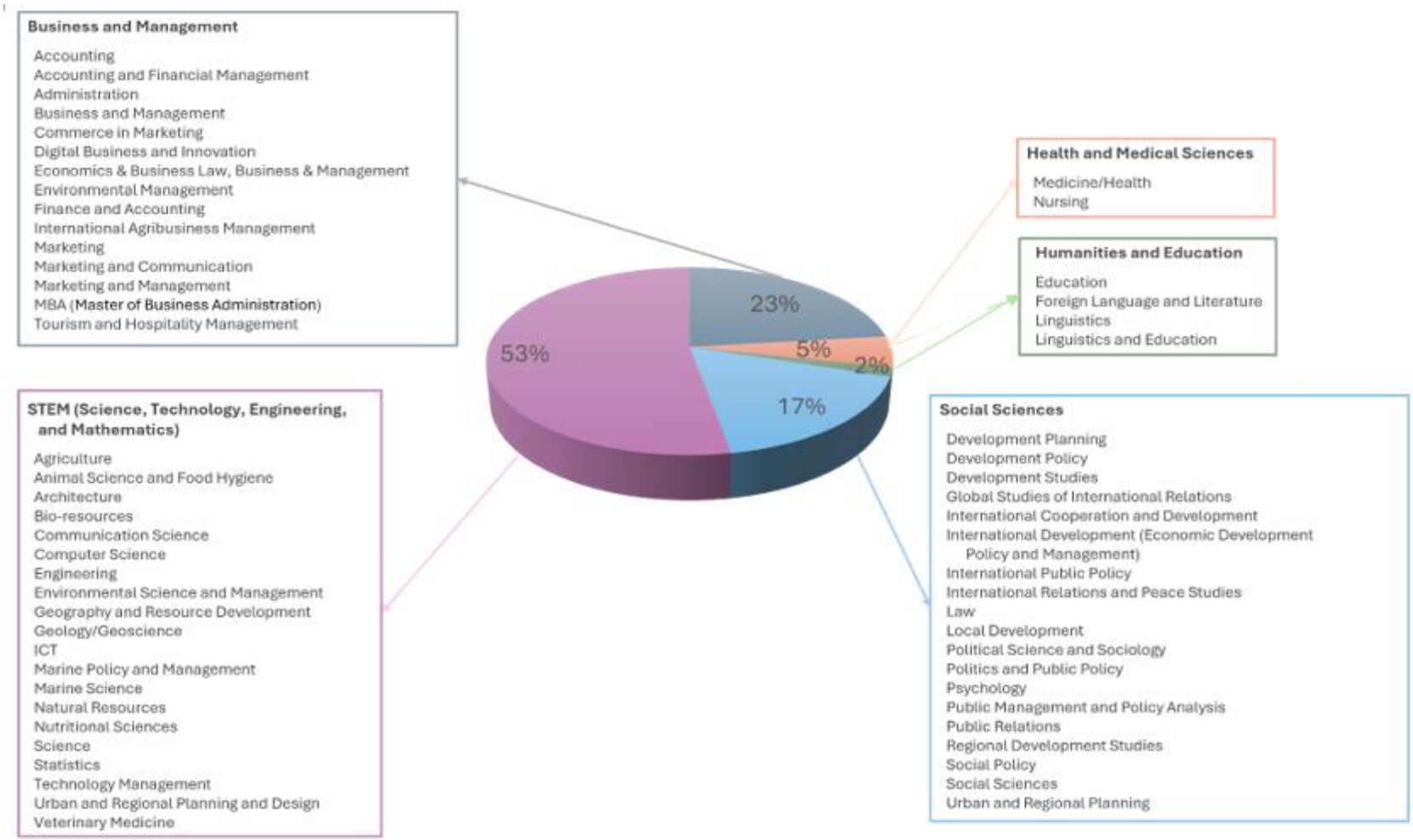


Figure notes: The diagram was generated from survey data and shows the distribution of five broad fields of study during the ABEI program. These five broad fields are derived from 62 specific academic disciplines.

Appendix Figure A3. Distribution of Respondents' University by Prefecture

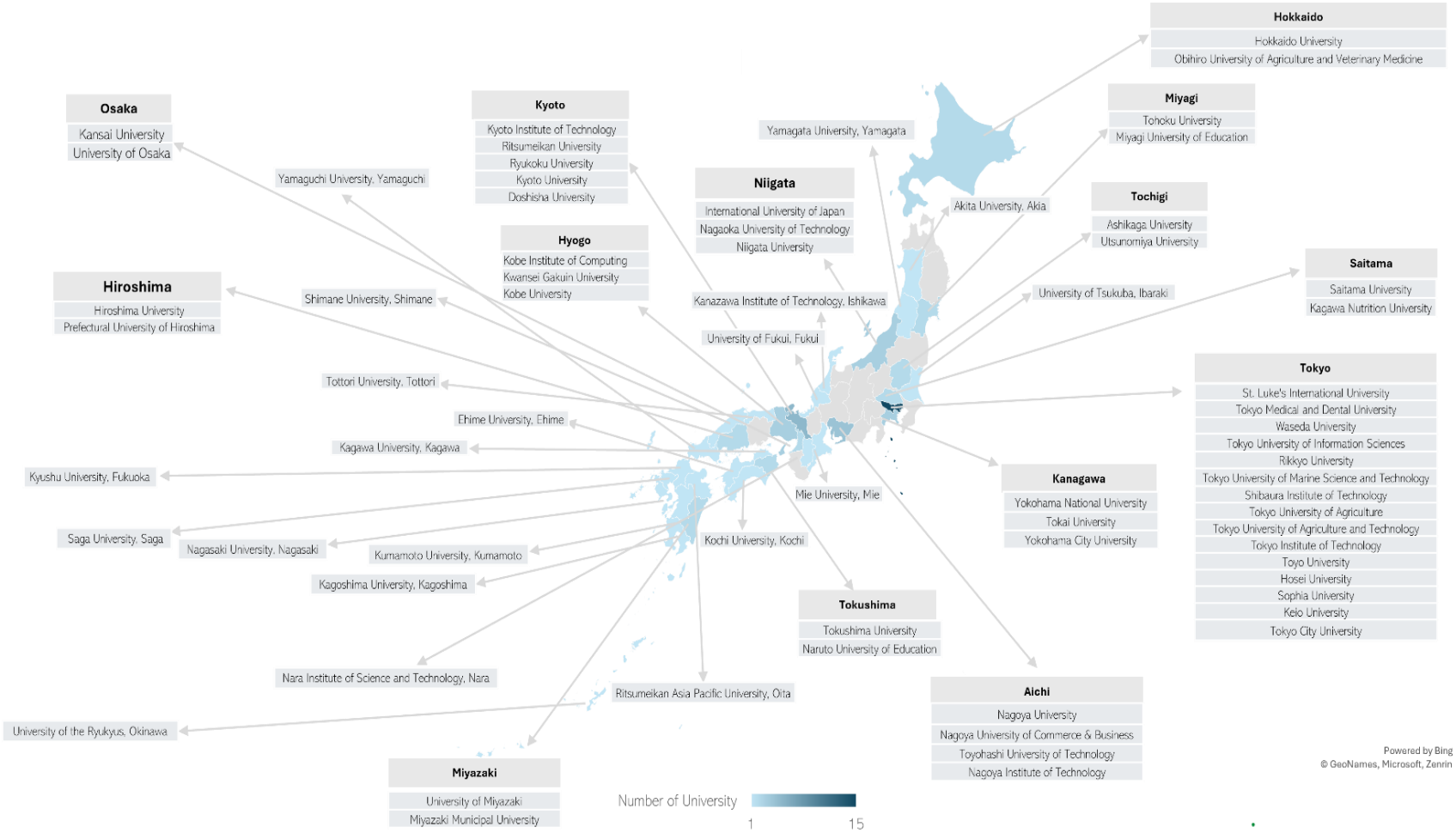


Figure notes: The diagram was generated from survey data. The darker the blue color, the higher the number of universities from the prefecture. Grey areas indicate no university from that prefecture. In total, respondents reported studying in 70 different universities across 34 prefectures.