Training Effect of Japanese Management on African SMEs:
The Case Study on Japanese Kaizen Training in Tanzania

YESSICA C.Y. CHUNG
Department of Agribusiness Management
National Pingtung University of Science and Technology
Address: 1, Shuefu Road, Neipu, Pingtung 912
TAIWAN (R.O.C)
yessicachung@mail.npust.edu.tw

Abstract: - Empowering indigenous African enterprises to participate in international supply chain, management education and training is desperately needed in African continent. We implement a 3-week experimental training program in a furniture cluster of Arusha, Tanzania. The program embeds Japanese management technique, named Kaizen, with entrepreneurship enhancement and financial management. Six months after the training course, a total number of 268 cluster-based furniture enterprises including training participants and their non-participant counterparts are interviewed. The results show that despite being disinterested in Kaizen at first, treatment enterprises put it in their business practice. This is more evident in an on-site coached group who received one-on-one introduction. We conclude that the Japanese cultural-embedded management practice, Kaizen, is present in the study area via the individual coaching combined training program; however, the business performance measured by labor value-added not yet reflects the training impact. We raise potential reasons for the insignificant training impact, the discrepancy between real-time and post-training interviews in the paper.

Key-Words: - Training effect; management training, African enterprise; Japanese Kaizen, SMEs

1 Introduction

Small and Micro-sized Enterprises (SMEs) accounted for 90% of private business and contribute to more than 50 % of GDP and employment in Sub-Saharan Africa [1]. Despite their crucial role in job creation, merely one percent of the small enterprises can successfully transit to established firms [2]; most remain small in scale or failed out of the market during the infancy stage. The major cause of business failures of SMEs across the world results from management mistakes, in particular, owner's lack of entrepreneurship and their incapability in finance and management [3, 4].

To achieve self-sustained growth, enhancement of management skills of African enterprises appears to be imperative while some research attributed African enterprises' stagnant development to low technological level and financial constraint (e.g.,5, 6, and 7]. Indeed, as highlighted by another strand of literature [e.g., 8, 9], the major problem of African enterprises virtually lies on managerial unskillfulness such as the abilities of planning, organizing company's resource to achieve profit target. World Bank [10] suggests that the importance of human capital building is more critical than other factors such as technology to empower Africa to become a bigger player in the global economy. Noorbakhshs and Paloni [8] concretely instantiate the management deficiencies of African entrepreneurs; they simply open small stores to sell what they are able to produce and wait for customers to shop. Herrington and Wood [9] state that albeit access to finance of African small enterprises is significantly associated with small enterprises' financial management practice, increasing financial access alone cannot improve financial support to small enterprises but the improvements in small enterprises' financial management is the key. Nevertheless, most training programs implemented in the continent are technology relevant. In addition to the long-standing neglect on management, another reason is because management technique is not completely transferable due to the fact that management training is not purely a means of skill formation but a cultural embedding activity.

Instilling a new management philosophy from one country to the other is challenging, in particular when two countries have a wide socio-cultural distance, for example from industrialized to less developed countries (11, 12, 13) because difference in national culture, value and norm such as people

beliefs about science can cause a low acceptance of a new management practice [e.g., 13]. The well-known Japanese style management technique, *Kaizen*, unlike Western style that stresses innovation (i.e. a drastically technological breakthrough) emphasizes subtle and continuous improvement of productivity given current technology [14]. In other words, *Kaizen* is not a particular tool or technology to detect product quality, but a Japanese culture-embedded philosophy that advocates long-term orientation, quality assurance, lowering of cost and time to achieve efficiency. Given the technology level in Africa, developing business skills through the introduction of *Kaizen* in the region may be desirable and enable African enterprises to become players in the international market.

One of the purposes of this study is to enhance human capital of African enterprises through an experimental 3-week management training course to the selected cluster-based furniture small enterprises in Arusha, Tanzania. The management training program integrates *Kaizen* technique with technical management skills including accountancy and financial courses. Shortly after in-class training and individual coaching training, real-time interviews are administered in order to know recipients' perception and satisfactory of the training. In addition, six months after the entire training program, a census survey of cluster-based furniture enterprises was conducted. In total, 268 cluster-based furniture entrepreneurs are interviewed. Both the real-time interview and post-training survey data are used for the training assessment in this paper.

The paper proceeds as follows. Section 2 reviews literature on management training and illustrates our training program that implemented in the study area, the city of Arusha, Tanzania. Section 3 presents the data collected from post-training interviews and introduces DID-PMS methodology. Section 4 reports empirical results. Section 5 presents conclusions and provides suggestions.

2 Management Practice in Africa

Research regarding management practice in Africa remains scarce. According to the Proudfoot Consulting [15] which conducted a cross country comparison on corporate management, African companies are relatively inefficient, and the causes are attributed to poor management. The consulting report illustrates that the most frequently observed poor management practices in the area are insufficient management planning and control and inadequate supervision. The report of Proudfoot Consulting is consistent with Noorbakhshs and Palonis' [8] observation in Africa. Noorbakhshs and Palonis pointed out that African enterprise starts up business majorly because of less complication in the technology and lower market barrier rather than having prior understandings on the industry and product market. After the setup, their customers are friends and neighbors as a result of limited sales and marketing skills. Besides, another often quoted management deficit is low financial management skills. Despite possessing management tools such as accounting systems, African enterprises are not familiar with the operation. Few enterprises separate business from personal accounts; needless to say maintain financial documents [e.g. 16]. These are practical evidences that managerial capital is missing in developing countries, as stated by Bruhn et al. [7]. Several studies attempt to improve SMEs' management skills in developing countries by providing experimental training courses and evaluating the training impacts afterwards. Mano et al., [9], for example, provided basic-level management training in Ghana, and found the training effect on survival rate to be significantly different between the treatment group and the control group, i.e., none of the SME's that participated shut down their businesses compared with 10% of non-participating ones. However, accounting-based performance such as sales and profits of the treatment group does not change much compared with their non-participating counterparts. Similar to the African SMEs, the SMEs in Latin America have not performed better in terms of accounting-based performance after receiving short-term and class-room type training courses [7, 8]. However, the training courses do improve the SMEs' practice. This may suggest that SMEs in developing countries are more in need of practical and on-site coaching courses.

Apart from entrepreneurship and financial management skills, African small enterprises critically lack skills in product quality management. An UNCTAD [17] survey indicates that product standards, quality and delivery are the key factors preventing transnational companies from integrating African small enterprises in their supply chains. What is often observed in African enterprises is that a purchase decision is made through intuition rather than based on scientific and systemic analysis beforehand, which lead to a high production cost. Not surprisingly few African entrepreneurs can make a reasonable estimate of the minimum production needed to break even [16].

The fatal management skills of African entrepreneurs deter international companies from involving them in global supply chains. In view of the desperate need of management education and

training in the continent, we implement an experimental training program aiming to enhance entrepreneurship spirit, production management and financial skills in the Arusha city, Tanzania. Before detailing our management training program, it is worth introducing education and job training resources in the study area, particularly those related to furniture industry. The city of Arusha has two higher education facilities: Arusha Technical College (ATC) and a Vocational Training and Service Centre (VTSC). The former was established in 1978 and provides both engineering and management skills, while the latter was established in 1998 and mainly delivers engineering skills in Northern Tanzania (Arusha, Tanga, and Kilimanjaro regions). In addition to the province-level vocational organizations, the well-known national training organization in Tanzania is Small Industries Development Organization (SIDO) which is an operational agency of its Ministry of Trade, Industry and Marketing of Tanzania, aiming to develop SMEs. As parts of its tasks, SIDO provides Tanzanian SMEs with trainings courses in techniques as well as in business management and marketing. However, few Arusha-located enterprises were ever trained in SIDO and none of our observed furniture enterprises received training programs provided by SIDO due to the fact that SIDO is located in the capital Dar es salaam.

2.1 Kaizen Training Program

A survey conducted in 2007 in the same area reveals management deficit and, in turn, it severely impedes business development of SMEs.[1] For example, they purchased timbers more than necessary, and disperse unused timbers outside enterprises without any humidity-protective cover; lacking of costing management, they used to pour in timber and other materials disproportionate to one piece of furniture. While complaining the shortage of cash to run furniture business, they were not aware of the amount of earnings from furniture business and side businesses**;** none of them understood the basics of finance and accountancy to separate self-money from business. Such instances motivated the training program.

In 2009, three modules concerning management are designed for the Arusha cluster-based furniture enterprises.[2] The training program incorporates a Japanese management technique, *Kaizen*, into management practices including entrepreneurship, and financing and bookkeeping. Module One has a focus on entrepreneurship spirit, and business plan and business strategy initiation. Relevant classes attempt to inspire participants to challenge global market. Firstly, participants learn the difference between needs and wants of customer; the strategy changing customers' wants into needs; the skills luring new customers and retaining existing customers. Secondly, the problem tree and objective tree are introduced; participants learn to map out the hierarchy of problems and objectives of their furniture business. Participants are trained accordingly to develop business strategies and action plans to address their current problems as well as respond to market change. Lastly, SWOT analysis, which aims to identify the business position in the industry, is illustrated in the class and participants practice to conduct this analysis for their business as well. Therefore, the participants are anticipated to be able to tap and acquire potential markets for their furniture business.

Module Two, namely *Kaizen*, aims to enhance participants' production efficiency through continuously reducing resource waste in their production process. The essence of *Kaizen* lies in lean concept and self-discipline, taking five movements (5S) to remove three redundancies (3M). Both 5S and 3M take from acronym of Japanese words: 5S is Seiri (organization), Seiton (neatness), Seiso (cleanliness), Seiketsu (standardization) and Shitsuke (discipline); 3M includes Muda (waste), Muri (strain) and Mura (discrepancy). 5S deployment throughout the production process from material purchase, processing, assembly, marketing and delivery is recognized to reduce resource abuse in materials, time, and human capital. In the *Kaizen* training, stock card system is applied to assist in 5S implementation. The goal of *Kaizen* is to achieve Total Quality Management (TQM) and productivity improvement. Therefore, *Kaizen* participants are expected to be efficient in production process and able to differentiate their products in better product quality from enclave peers'.

Module Three provides participants financial management skills via using various financial records. The importance of the separation between business and personal spending is firstly emphasized and imparted to participants in this class. Participants learn a practical use of a series of financial books, including cash book, invoice book, purchases book, sales book, creditor's book and so forth. Meanwhile, the relevant accountancy such as inventory of raw materials and finished goods, type of sales and purchase transactions are introduced. Through these learning, participants understand the cost structure of their business and learn how to price their products for profit as well as manage their cash flow. Another topic covered in Module Three is financing. Participants learn how to raise

capital from financial institutions. Type of loans, conditions and legal requirements for these loans, are briefed in the class. Participants are expected to practice bookkeeping and further be able to apply for loans from financial institutions after training.

Each of the three modules lasts five days a week, three hours a day. In order to encourage the attendance and reduce furniture producer's opportunity cost on attendance and the self-selection caused by time manner, the training program is implemented in the evening, the close time of the enterprises, starting at 5 pm and ending at 8 pm. Following in-class training, on-site coaching is delivered by trainers who are certificated by ILO and GTZ. Of which 3 trainers, the one who is responsible for *Kaizen* is a manager of Kenyan big company who practiced *Kaizen* for many years. In addition, we have Japanese experts with practical business experience to supplement with the training delivery. Following in-class training, one-third of the participants in each module are randomly selected to on-site consultation and coaching. The in-class instructors and Japanese experts exclusively visit the enterprises of selected participants in the daytime while the enterprises open (Table 1).

2.2 Sampling

The authorized number of training participants is 60.[3] Systematic sampling is conducted to invite 60 participants; knocking doors of every other enterprises in each sub-cluster i.e., skipping one enterprise between enterprises. 107 enterprises were visited through door-knocking, and among them 60 owner-managers showed willingness to participate the training program.[4] We organized a sensitization enterprise in order to establish the list of prospected participants as well as to interest them by telling them the benefits of the training. However, some enterprises which initially showed willingness to attend did not come. In addition, some enterprises sent more than one owner. As a result of the first round convocation, we recruited 49 owner-managers through door knocking approach.[5] To enroll more 11 participants, open invitation was carried out; however, at the end only two were owner-managers and the remaining 9 people were co-owners whose owner-managers were already included.[6]

2.3 Real Time Interview

Among the total of 60 participants (51 enterprises), 4 participants (4 enterprises) dropped out in the early training stage for personal reasons. As a result (Table 2), 47 enterprises (56 participants) completed our training program. Right after in-class training, interview on participants' feedback was conducted. Overall, participants revealed a high content with the overall training program; among 47 enterprises 93% highly acknowledged the overall training program. While further asked of the most expecting subjects for advanced training programs, 46% of 47 enterprises stated the subject of business strategy, followed by the subjects of accounting 29% and manufacturing techniques 27%. In contrast, only 11% were interested in advanced *Kaizen*.[7] This implies that African entrepreneurs think they lack the skills in business strategy rather than in improving product quality, meaning they remain unconvinced with *Kaizen* philosophy shortly after training.

Following in-class training course, we randomly selected 80% (38 enterprises) of in-class training participants to three modules of on-site coaching training course in which 16 enterprises were randomly selected to Module one; 9 to Module two and 14 to Module three, respectively.[8] Similarly, real-time interview regarding on on-site coaching was conducted. As shown in Table 2, of the total 38 on-site coached enterprises, 23 (61%) emphasized that their strength is laid on the product quality and production skills; 26% attributed their strength to having processing machinery.[9] While asked of the weakness, not surprisingly, 58% enterprises identified the capital constraints as the major obstacles to their business. 26% respectively revealed concern with lack of business strategy and location and space of their enterprises. Consistent with the outcome of in-class interview, no enterprise was concerned about production management skills. Rather, they were proud of their quality, and desperate for marketing strategy to sell product.

While asked of the potential and opportunity of their business, 92% responded with optimistic attitudes, stating "market is there"; they appeared confident with their skills in attracting new customers after the training. Only two enterprises considered the possibility of taking out a financial loan to expand their business. While inquired about the threat, 50% stated the rising price of timber and other materials as well as the resource of timber; 45% pointed the fierce competition from big local competitors. Of which, four enterprises sensed the threat from oversea competitors, notably, Dubai and China.

Aforementioned results suggest that the most trained enterprises were not keen with international trend, and therefore not attuned themselves to meet international needs. As they all avowed the confidence of tapping new market, it is more likely they end up with launching homogenous opportunity-oriented business strategy and luring

the same layer of customers. Unless they improve their production management and product, their post-training performance keep unchanged as usual. This also explicates that the essence of *Kaizen* technique was not yet perceived by trained enterprises right after training course.

E-ISSN: 2224-2899

Table 1: The Contents of Training Program

Moduel	Objectives	Topics	Contents	Expected Outcome
Entrepreneurship	Realize and position their business	1.1 Entrepreneurship	. Entrepreneurship and personal characteristics . Role model . Entrepreneurship and management	a. customer increase b. Business order increase
		1.2 Business strategy	. Market game and processing	
		1.3 Market Strategy and Business Analysis	. Lure customer .SWOT analysis . Strategies for improvement	
		1.4 Planning	. Action plan . Sharing group work in the plenary	
Gemba Kaizen	Enhancing productivity through waste reduction	2.1 Gamba Kaizen	. Site improvement	Kaizen
		2.2 5S (Sort, Set in order, Shine, Standardize, Sustain)	. Stock card system	
		2.3 Site visit		
		2.4 Inventory control		
		2.5 Autonomous maintenance		
Record Keeping		3.1 Recod keeping	. Accounting records . Managing growth . Tracking business on paper . Recoding transactions cash sales . Pricing for profit	bookkeeping
		3. 2 Cash flow management	. Selling to make a profit . Break-even point . Access to finance	
		3.3 Financing	. Working with financial institutions . Legal requirements	

Source: Authors

Table 2: Summary Statistics on The Characteristics of The Sample Enterprises

	Total	**Treatment**			**Control**	**Difference (T-C)**
			Classroom+Coaching	**Classroom**		
No. of entrepreneurs	268	32	22	10	236	
Age of entrepreneurs	36.23 (8.28)	35.97 (8.10)	36.5 (7.98)	34.9 (8.72)	36.26 (8.31)	-0.298
Chagga D=1 (%)	45.15	62.5	63.6	60	42.8	19.7**
Years of schooling	9.5 (2.63)	9.03 (1.99)	9.1 (2.07)	8.9 (1.91)	9.56 (2.70)	-0.528
Furniture-related work experience D=1 (%)	16.79	9.38	4.5	20	17.8	-0.084
Training experience D=1 (%)	2.99	12.5	4.5	10	1.69	10.81***
Years of operation	6.73 (6.50)	7.69 (5.74)	8.4 (6.32)	6.2 (4.10)	6.6 (6.55)	1.083

Note: 1. 9 participants of module 1, 2 participants of module 2 and 11 participants of module 3 respectively remain in the sample.

2. Standard deviation is reported in parenthesis. *significant at 10%; ** significant at 5%; ***significant at 1%

3 Post-Training Evaluation

A follow-up survey of training program was conducted in six months after the training program. 268 furniture enterprises were interviewed, of which 32 enterprises participated in our training program; 15 enterprises were no longer located in the cluster.[10] Among 32 enterprises, only one enterprise joined the training through open invitation.

To ensure quality of the survey, we procured six local enumerators,[11] who did not engage in the training activities, to carry out the follow-up census survey. They were trained in terms of inquiry skills before interview tasks. For example, they are requested to interview owners of the enterprises, and if owners were not available in the visiting day, enumerators did not release the visiting purpose to the respondents. During the interview, enumerators were not allowed to give any hints to interviewees in any situation. On the other hand, to avoid the concern of Hawthorne effect, i.e., the training participants tend to overstate the business outcome relating to the training program they attended, we trained enumerators to follow some criteria to evaluate furniture enterprises they interviewed.

3.1 Methodology

Using the dataset collected from post-training survey, we apply Propensity Score Methodology with Difference-In-Difference (hereinafter, PSM-DID) in assessing training effect.

A random selection on treatment and control groups is a prerequisite for assessing training impact, which indicates the independence of participation in the treatment with attributes of participants. However, this requirement is not always valid in experimental training program because participants' selection on treatment is likely to be associated with their pretreatment characteristics. Self-selection can mislead the treatment outcome. To remove the selection bias, Heckman and Smith [18] proposed PSM-DID approach in which treatment group are matched with control group in terms of their critical attributes that potentially influence their attendance and treatment effect. In our program, we cannot rule out the possibility of a higher participation from relatively large enterprises who on average outperform over their small in scale counterparts regardless of the training effect.[12]

The focus of this paper is the Average Treatment Effect on the Treated (hereinafter, ATT), which refers to the effect on who actually participated in trainings. The ATT is expressed as follows.

$$\begin{aligned} ATT &= E(Y_1 - Y_0 \mid T=1) \\ &= E(Y_1 \mid T=1) - E(Y_0 \mid T=1) \end{aligned} \tag{1}$$

Where Y_1 denotes the outcome for training participants; $T=1$ if persons receive training; therefore $E(Y_1 \mid T=1)$ denotes the expected training effect on the treated, and $E(Y_0 \mid T=1)$ represents the expected training effect on control group. The former term is easily measurable; however, the latter, $E(Y_0 \mid T=1)$ is unobservable because we do not observe Y for the treated firms if they had not been treated.

Eq. (1) can be defined conditional on some characteristics X .

$$\begin{aligned} ATT &= E(Y_1 - Y_0 \mid X, T=1) \\ &= E(Y_1 \mid P(X), T=1) - E(Y_{0\mid} \mid P(X), T=0) \end{aligned} \tag{2}$$

To identify the ATT, two assumptions are assumed. The first is called conditional independence assumption, indicating that outcomes (Y_0, Y_1) are independent of participation status T conditional on observed characteristics X

$$(Y_1, Y_0) \quad \coprod T \perp X \tag{3}$$

Secondly, common support assumption means a positive probability of participation status is assumed so that matches for $T=0$ and $T=1$ observations can be found.

$$0 < \Pr(T=1 \mid X) < 1 \tag{4}$$

If the number of conditioning variables X is large but number of observation is small, the matching estimators can be difficult to implement due to the curse of dimensionality problem. For this reason, Rosenbaum and Rubin [19] provided the approach *propensity score* to address the problem. The Eq. (2) can be expressed as

$$\begin{aligned} ATT &= E(Y_1 - Y_0 \mid X, T=1) \\ &= E(Y_1 \mid \Pr(X), T=1) - E(Y_0 \mid \Pr(X), T=0) \end{aligned} \tag{5}$$

After conditioning on propensity score calculated on a set of characteristics of individual entrepreneur, a selection bias-free training outcome can be estimated by Eq. (5). However, systematic differences between participant and nonparticipant outcome may still remain. For example, program selection on unobserved variables may raise a "hidden bias". To address such heterogeneity in the initial conditions of two groups, Heckman, Ichimura

and Todd [20] and Heckman, Ichimura, Smith and Todd [21] proposed a difference-in-differencing (DID) matching strategy (hereafter, DID-PSM).

Let t and t' be pre-training period and post-training period respectively, ATT measured by the DID-PSM (hereinafter, $ATT_{DID\text{-}PSM}$) can be expressed as

$$ATT_{DID-PSM} = \frac{1}{n_1}\sum_{i\in I_1}\left\{\begin{array}{l}[(Y_{it'}|T=1)-(Y_{it}|T=0)]- \\ \sum_{j\in I_0} W[P(X_i),P(X_j)]\times[(Y_{jt'}|T=1)-(Y_{jt}|T=1)]\end{array}\right\} \quad (6)$$

Where n_1 is the number of observation in the treatment group. I_1 and I_0 respectively denote the treatment and the matched control groups. W denotes a weight which is determined by the distance between propensity scores of the treatment group and the matched control group. This paper uses nearest neighbor matching weight which is a pair wise matching, the non-participant with the value of propensity score that is the closest to the value of propensity score of participant is selected as a match. In addition, this matching approach is performed with replacement in this paper, i.e., the same comparison group observation is used repeatedly as a match. To obtain reliable standard errors, we performed bootstrap standard errors obtained by 50 replications in $ATT_{DID\text{-}PSM}$ matching estimators. The data obtained from the baseline survey in 2007 enables this paper to measure the $ATT_{DID-PSM}$ shown in Eq. (6). The data in details are introduced in next section.

3.2. Data

The variables used in training evaluation are listed in Tables 3 and 4. The former lists enterprises' attributes that potentially influence the probability of training attendance; the latter lists the variables of interest the business practices and performance related to our training program. Pretreatment characteristics include educational attainment, age, past occupation, the number of year of operation, the location of enterprise and training experience.[13] In addition, ethnicity is an important predictor of training participants in Arusha context, we construct this variable as a dummy with a value of one if the producer is from Chagga ethnic group, zero otherwise.[14]

Pretreatment difference between participants (treatment group) and non-participants (control group) in characteristics is shown in Table 3. Control group (32 enterprises) is further divided into in-class alone (10 enterprises) and coaching combined sub-groups (22 enterprises). Of 22 on-site coached enterprises, 9 entrepreneurs, 2 entrepreneurs and 11 entrepreneurs respectively attended module 1, module 2 and module 3 on-site trainings and no one was exposed to more than one module. According to the table, a typical indigenous entrepreneur is portrayed as a male aging 35, Chagga, secondary school degree, operating furniture enterprises for 7 years with no management training experience prior to our training program, no furniture related work experience before the current job. Surprisingly, Chagga ethnic group is over-represented taking about 64% of the participants. The participants were randomly selected with the expectation that Chagga would accounted for 40%. We make three conjectures based on the observations on the fieldwork. First, because of strength of ethnic networks, the ethnic Chagga has more access to training information and are more willing to participate in training program. Second and related to the first one, the other ethnic minorities are reluctant to participate in the training while they know the majority will over-represent in the training program. Third, Chagga enterprises are more likely to survive in the cluster thanks to ethnic networking effect. In terms of management training experience, 10 % of in-class group are ever trained in management skills. The other statistically significant variable is the training experience. The difference of 5.8% with 1% significant level indicates that program-participated furniture enterprises have more experience in informal trainings than non-participants, i.e., furniture entrepreneurs with training experience are more likely to participate in new training activities.

Table 3: Summary Statistics on Performance

		Treatment		Controll	Difference (T-C)
		Classroom + Coaching (1)	Classroom (2)		
Value added (Thousand Shillings)	Three modules				
2007		681 (745.33)	664.5 (787.83)	717.2 (680.52)	374.7 (624.83)	306.30**
2009		760.28 (645.14)	742.3 (678.74)	799.9 (596.74)	472.94 (760.25)	287.35*
Visiting customer (person)	Mod1				
2007		2.07 (1.29)	2.8 (1.83)	1.8 (0.93)	1.94 (1.28)	0.13
2009		1.93 (1.22)	2.6 (1.56)	1.7 (0.97)	1.96 (1.37)	-0.03
Phone orders (piece)	Mod1				
2007		5.13 (7.77)	9.1 (13.24)	3.3 (2.05)	4.85 (9.90)	0.29
2009		5.34 (7.77)	10.3 (13.04)	3.2 (2.02)	5.01 (12.03)	0.33
Kaizen D=1 (%)	Mod2				
2007		18.75	0	20	22.94	-0.04
2009		68.75	100	66.7	29	39.74**
Bookkeeping D=1 (%)	Mod3				
2007		18.75	9.1	23.8	22.03	-3.28
2009		71.88	72.7	71.4	30.08	41.79***

Note: 1. 9 participants of module 1, 2 participants of module 2 and 11 participants of module 3 respectively remain in the sample.

2. Standard deviation is reported in parenthesis. *significant at 10%; ** significant at 5%; ***significant at 1%.

Table 4 shows the difference and the significant level in business performance between participants and non-participants. Furniture enterprises in Arusha are small in size, their product life-cycle from business order, material processing, assembly, finished product, pricing to sales, could be short. Ideally, the outcome of training could be quickly reflected on business performance. Thus, if our training program generates a positive impact, an increase in number of customers, improvement in production management and engagement in bookkeeping can be observed in a half of year post-training. The performance indicators related to the training program include the number of visiting customers, phone orders, *Kaizen*, book keeping and labor value-added. The overall impact is measured by labor value-added, calculated as profit (revenue minus cost) divided by number of workers. The variable visiting customers, the average number of customers per day, is used to assess Module 1. An alternative indicator for assessing Module 1 is the number of phone orders. As mobile phone is prevalent in the area, orders from phone call are often observed. The term *Kaizen* is used to estimate Module 2, indicating that enterprises put *Kaizen* in practice. Similarly, book keeping is used to assess the implementation of bookkeeping practice.

The evaluation standard on *Kaizen* and bookkeeping implementation is worth further illustration.[15] *Kaizen* implementation is checked by the 5S deployment; if any of the 5 practices is implemented in the furniture enterprises, the enterprise is identified as *Kaizen* practitioner. As for the bookkeeping implementation, respondents were requested to show their ledgers if they stated that they put the techniques in practice. Only the enterprise that showed the evidence of recording on business is recognized as a bookkeeping practitioner.[16]

The difference between two groups in terms of labor added-value decreased from 306 thousand shillings in 2007 to 287 thousand shillings in 2009, both figures remain significant, indicating that participant significantly outperformed over non-participants, but the scale declined. Following the overall performance, the indicators representing the outcomes of module 1, visiting customer and phone orders show no difference between two groups in both pre- and post- treatment years. On the other hand, we observed substantial change from 2007 to 2009 between two groups in *Kaizen* practice. To be precise, the performance of participated enterprises were inferior (but insignificantly) to that of non-participants in pretreatment, but became significantly superior in planning and organizational skills to their non-participant counterparts in 2009. Similar pattern is observed in terms of bookkeeping which represents the outcome of Module 3, i.e., only 18.75% of participants organized their production site in pre-training while about 22 % of non-participants did so, but post-training, approximately 72% of participant kept their production flow clean and organized, while the number of non-participants remained low (about 30%).

Table 4: Statements while inquired about SWOT in on-site coaching

Topics	Statements	N. of Obs.	Ratio
Strength	Experience & Skills & Talent	23	58.97
	Personal networks	10	25.64
	Merchanery	9	23.08
	Good product quality	6	15.38
	Others	5	12.82
Weakness	Capital constraints	22	56.41
	Lack of business strategy	10	25.64
	Location and space of the workshop	9	23.08
	Low productivity	5	12.82
	Others	6	15.38
Opportunity	Potential market	32	82.05
	Others	3	7.69
Threat	Timber and material price	19	48.72
	Competitor	17	43.59
	Others	8	20.51

Source: Authors based on the collected data

4 Empirical Results

The $ATT_{DID\text{-}PSM}$ of overall training impact, on-site coaching impact and in-class impact are respectively estimated and presented in Tables 5-7.

4.1 Overall Training Effect

Table 5 presents the $ATT_{DID\text{-}PSM}$ between treatment and control groups. The $ATT_{DID\text{-}PSM}$ of labor value added is 0.28 thousand shillings, indicating that treatment group slightly outperformed over control group; however, the t-value of 1.33 indicates insignificance in magnitude. Both *Visiting customer* and *Phone orders* represent the outcome of Module 1. These two numbers range from -0.099 to 0.505 with t-test of 0.41 and 0.60, indicating that no significant difference between two groups in terms of outcome of Module 1. In

contrast, both the *Kaizen* and book keeping variables prove significant (both with p-value of 0.01). $ATT_{DID\text{-}PSM}$ estimates show that compared with the control group, participants perform production and quality management, and regally record their business operations by 40.7 % and 48.1%, respectively. In other words, given attributes, participants start undertaking production management and financial management. Accordingly, Table 5 suggests the efficacy of our training program in changing business practices of the treatment group; however these changes haven't had significant impact on performance measured by labor added-value**.**

Table 5: ATT (Treatment group vs. Control group)

	Related module	Average Treatment Effect on the treated (ATT)	t-value
Value added (Thousand Shillings)	All	0.279	1.33
N. of visiting customer (person)	Mod1	-0.099	0.41
Phone orders (piece)	Mod1	0.505	0.60
Kaizen (%)	Mod2	40.7	3.61***
Business record keeping (%)	Mod3	48.1	4.64***

Note: 1. 9 participants of module 1, 2 participants of module 2 and 11 participants of module 3 respectively remain in the sample.
2. *significant at 10%; ** significant at 5%; ***significant at 1%

4.2 In-class Training Effect

As a confirmation of coaching effect, exclusive in-class training effect is examined in this section. If the effect of on-site coaching training is superior to in-class training, we assert that on-site coaching is necessary in such experimental job training design. Table 6 compares the difference in performance between in-class training group and control group. Results show that in-class trainings of modules one and two had no impact on participants' skills in attracting and developing new customers. In contrast to no difference in revenue between the two groups, the improvements in *Kaizen* and keeping business record of participants are significant with p-value of 0.001. The magnitudes are respectively 40 % and 50% in *Kaizen* and business recording. Overall, the pattern of the current results is similar with that in Table 5, implying that impact of in-class training is as good as a combined effect of in-class and on-site coaching training.

Table 6: ATT in-class training effect (In-class vs. Control)

	Related module	Average Treatment Effect on the treated	t-value
Value added (Thousand Shillings)	All	0.034	0.1
Visiting customer (person)	Mod1	-0.157	0.6
Phone orders (piece)	Mod1	0.083	0.11
Kaizen (%)	Mod2	36.0	2.41**
Keeping business record (%)	Mod3	42.1	3.40***

Note: 1. 9 participants of module 1, 2 participants of module 2 and 11 participants of module 3 respectively remain in the sample.
2. *significant at 10%; ** significant at 5%; ***significant at 1%.
3. Standard errors are obtained from bootstrap

4.3 On-Site Coaching Effect

Another interest of this paper is the effect of on-site coaching which is seldom explored in literature. In the individual site coaching, the trainee could observe the practices in person as well as receive specific and concrete advices from instructors to improve their individual weakness; therefore, the training effect on coaching group is expected to be larger than the one on participants who received solely in-class training. The $ATT_{DID\text{-}PSM}$ estimates of coaching training are presented Table 7. Overall, on-site coaching has exclusively impact on *Kaizen*. The $ATT_{DID\text{-}PSM}$ estimate of Kaizen is 100% with t test of 2.85, significant at 5% level, indicating that all trainees of on-site coaching training program improved their production environment while no non-participants did so. Contrary to an significant improvement on *Kaizen* practice, no significant $ATT_{DID\text{-}PSM}$ in business recording of on-site coaching group, indicating that individual coaching didn't have superior impact on bookkeeping practice. Table 7 implies that apart from in *Kaizen* practice, in-class training is equivalently good as an on-site coaching combined training program.

To sum up the results of Tables 5-7, in contrast to the exit-interview results which reveal participants' pessimistic attitude toward *Kaizen*, the

post-training results show that the participants put *Kaizen* into practice daily or monthly and this is evident in the on-site coaching group. However, the training outcome has not yet shown on a short-term business performance measured by labor value-added. Arguably, results show that apart from *Kaizen*, on-site-coaching-combined training was no superior over in-class training.

We raise potential reasons for the absence of the impact of our training on the business performance. Firstly, improvement of productivity is an accumulation of increases in labor productivity and capital, rather than that a solely short-time training can completely reform the productivity. Therefore, there could be a positive impact on performance in a long run; if we keep eyes on those participants for a longer while, changes in productivity possibly could be observed. However, it also could be our training program has less impact on African enterprises' productivity. We conjecture that without a full understanding of *Kaizen* practice, participants tend to produce similar products and similar quality as usual. Despite being equipped with marketing skills, they launch homogenous strategy and lure the same layer of customers with their industrial peers. As a result, they barely achieve any progress in business performance after training.[17]

Table 7: ATT coaching effect (Coaching vs. In-class)

	Related module	**Average Treatment Effect on the treated**	**t-value**
Value added (Thousand Shillings)	All	0.068	0.24
Visiting customer (person)	Mod1	-0.302	0.47
Phone orders (piece)	Mod1	0.183	0.29
Kaizen (%)	Mod2	100.0	2.85**
Keeping business record (%)	Mod3	12.5	0.29

Notes:
1. 9 participants of module 1, 2 participants of module 2 and 11 participants of module 3 respectively remain in the sample.
2. The ATT of coaching effect of Kaizen is not computable due to insufficient number of observations; only two module 2 participants remain in our sample.
3. * significant at 10%; ** significant at 5%; ***significant at 1%.

We have no doubt on the effectiveness of our training program in terms of being cultural embedding or transmitting tool, while we hesitate to conclude the *Kaizen* impact on business performance for the time being. Besides, the training can in turn benefit Japanese companies who intend to expand their business to African continent in the future as those trained enterprises could be their potential candidates for subcontractors, which coincides with participants' expectation.

On the other hand, some researches offer the keys for *Kaizen* to be successfully transmitted outside Japan. Abo [12] suggests that a rather small cultural distance with Japan hits a higher likelihood of a successful implement of Kaizen technique. For African countries who have a relaxed attitude to quality and labor management which is poles asunder to Japan, transmitting the philosophy through Japanese affiliated company in the region is more likely to lead to favorable outcomes. Secondly, Kaplinsky [22] illustrates that *Kaizen* has an emphasis on the bottom-up review on quality detection and improvement which can only be perused while enterprises reach a certain scale in terms of number of employees. Therefore, perhaps medium business rather than small enterprise is the suitable training target for *Kaizen* practice.

5 Conclusion

Our training program features in the ingredient of Japanese management technique, Kaizen, in general management skills such as financial management. Using a dataset of 268 cluster-based furniture enterprises, in which 32 participated in our 3-week experimental management training program, this study assesses the training impact on the business practices and performance of indigenous African small enterprises. Results of real-time interview and post-training analyses show that Japanese management technique, Kaizen, now is well known within the Arusha city of Tanzania. Participants, in particular those who were individually coached, regularly put Kaizen in practice. However, consistent with the previous training-related studies, a short-term training program has not yet led to higher business performance in terms of accounting-based measurements.

Albeit the lean concepts of Kaizen appear yet to penetrate in the region, our training program succeeds in terms of management cultural-embedment. One of the reasons behind the success is the expectation of future business opportunities with trainer country or the financial or substantial aids. As suggested by literature, most successful African businesses are founded by former employees of expatriate firms. This illustrates the

significant role of knowledge spillovers generated in FDI in aping exotic business management. Therefore, we presume our trained enterprises can exhibit a sharp growth once they indeed affiliate with Japanese companies; in turn, Japanese companies will benefit from this training program in terms of having less cost in training their subcontractors. In other words, such management training program can become the preliminary test of reconciling the bilateral difference between trainer and trainee countries in business culture.

Acknowledgment

I thank JICA-RI for data sharing. I am thankful for Prof. Todo from Tokyo University for his concrete advice on methodology. The usual disclaimer applies.

Notes

1. The survey focus was put on the infrastructure issue.
2. The 2007 survey found that the furniture cluster consists of five sub-clusters.
3. Based on information obtained from the previous survey we randomly selected 20 percent of enterprises from each sub-cluster The survey conducted in 2007 found that the furniture cluster consists of five sub-clusters.
4. Some owners were absent from workshops when enumerators visited. In this case, the enumerator did not reveal the purpose of the visits. Enumerators did not record the 107 workshops being knocked. In the case of owners who did not show interest in the training, the detailed contents on the training programs were not revealed.
5. This passive attendance is not surprising because small enterprises in African countries are concerned about that the business information will be released to the tax regulatory once they attend the training. It is also possible that some enterprises are suspicious about the efficacy of management training.
6. Seven workshops have two or three co-owners who were allowed to take part in the training program but are not included in our analyses.
7. This is a no more than two answers multi-choice question.
8. The selection is supposed to be random; however, we cannot rule out the possibility of the over presence of Chagga ethnic group due to their networking influence in the area.
9. In SWOT analysis, enterprises can raise more than one item for their strength, weakness, opportunity and treat.
10. Since rural Tanzanian people are not required to register their addresses, we are not able to reach them once they move outside the clusters.
11. They speak Swahili language and have no communication problem with interviewees.
12. Enumerators tend to invite relatively big workshops as well as those located along main roads and reachable workshops instead of small and unreachable ones.
13. Literature suggests that gender is also a crucial factor affecting the probability of training attendance. However, all of furniture producers in our sample are male so the gender variable is not added in the estimations.
14. This variable is identified by the entrepreneurs' speaking languages as the ethnicity issue remains sensitive in Tanzania even through there is no racial clash, the strong ethnic community exists. Because every ethnic group owns its language, there is no identification concern between mother tongue and ethnicity.
15. Enumerators are trained in respect to the evaluation standard before interviews.
16. Participants were trained to separate their private money from business cash flow. So the ledgers are required to be for business purpose rather than private purpose.
17. Therefore, the declamation on *Kaizen* implementation could be the result of expectation on financial support in the future.

References:

[1] UNIDO, Capacity Building for Private Sector Development in Africa, *PSD Technical Working Papers Series*, No. 3, 1999, Retrieved from https://www.unido.org/uploads/tx_templavoila/Capacity_building_for_private_sector_development_in_Africa_01.pdf.

[2] Mead, D. C. & Liedholm, C., The Dynamics of Micro and Small Enterprises in Developing Countries, *World Development*, Vol. 26, 1998, pp. 61-74.

[3] Peterson, R. A., Kozmetsky, G., & Ridgway, N. M., Perceived Caused of Small Business Failures: A Research Note, *American Journal of Small Business,*Vol. 8, 1983, pp. 15-19.

[4] Larson, C. M. & Clute, R. C., The Failure Syndrome, *American Journal of Small Business*, Vol. 4, 1979, pp. 35-43.

[5] Akoten, J., Sawada, Y., & Otsuka, J., The determinants of credit access and its impacts on micro and small enterprises: The case of garment producers in Kenya, *Economic Development and Cultural Change*, Vol. 54, 2006, pp. 927-944.

[6] Bigsten, A., Collier, P., Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J. W., Oduro, A., Oostendor, R., Patillo, C., Söderbom, M., Teal, F., & Zeufack, A., Credit Constraints in Manufacturing Enterprises in Africa, *Journal of African Economies,*Vol. 12, 2003, pp. 104-125.

[7] Bruhn, M., Karlan, D. & Schoar, A., What Capital is Missing in Developing Countries? *The American Economic Review*, Vol. 100, pp. 629-633.

[8] Karlan, D. & Valdivia, M., Teaching Entrepreneurship: Impact of Business Training on Microfinance Clients and Institutions. The Review of Economics and Statistics, Vol. 93, 2011, pp.510-527.

[9] Mano,Y., IDDRISU, A. & Yoshino, Y., How Can Micro and Small Enterprises in Sub-Saharan Africa Become More Productive? The Impacts of Experimental Basic Managerial Training, Vol. 40, 2011, pp.458-468.

[10] Mohieldin, M. S. & Wright P. W., Formal and Informal Credit Markets in Egypt, *Economic Development and Cultural Change*, Vol. 48, 2000, pp. 657-670.

[11] Noorbakhsh, F. & Paloni, A., Structural Adjustment and Growth in Sub-Saharan Africa: The Importance of Complying with Conditionality, *Economic Development and Cultural Change*, Vol. 49, 2001, pp. 479-509.

[12] Herrington, M., & Wood, E., Global Entrepreneurship Monitor, South African Report, *Online Journal*, 2003, Retrieved from http://www.gbs.nct.ac.za/gbswebb/userfiles/gemsouthafrica2000pdf

[13] World Bank, Human Capital, 2014, Retrieved from http://datatopics.worldbank.org/jobs/topic/human-capital.

[14] Wasti, S. A., Cultural Barriers in the Transferability of Japanese and American Human Resources Practices to Developing Countries: The Turkish Case, *The International Journal of Human Resource Management*,Vol. 9, 2010, pp. 608-631.

[15] Abo, T., A comparison of Japanese 'hybrid factories' in US, Europe and Asia, *Management International Review*,Vol 35, 1995, pp. 79–93.

[16] Hofstede, G. Cultural Constraints in Management Theories, *Academy of Management Executive*,Vol. 7, 1993, pp. 81-94.

[17] Imai, M., *Gemba kaizen: A commonsense, low-cost approach to management*, 1997, McGraw-Hill Publishing Company.

[18] Proudfoot Consulting, *Missing millions: How Companies Mismanage Their Most Valuable Resource*, 2003, London: Proudfoot Consulting.

[19] Elkan, W, Entrepreneurs and Entrepreneurship in Africa, *The World Bank Research Observer*,Vol. 3, 1988, pp. 171-188.

[20] UNCTAD, *Small Scale Enterprise Development and Foreign Direct Investment in Africa: Challenges and Opportunities*, 2006, Retrieved from http://www.smmeresearch.co.za/SMME%20Research%20General/Working%20Papers/Small%20scale%20enterprise%20development%20and%20FDI%20in%20Africa.pdf.

[21] Heckman, J. J. & Smith, J. A., Assessing the Case for Social Experiments. *The Journal of Economic Perspectives*,Vol. 9, 1995, pp. 85-110.

[22] Rosenbaum, P. R. & Rubin, D. B., The Central Role of the Propensity Score in Observational Studies for Causal Effects, *Biometrika*,Vol. *70*, 1983, pp. 41-55.

[23] Heckman, J., Ichimura, H., & Todd, P., Matching as an econometric evaluation estimator: Evidence from evaluating a job training program, *The Review of Economic Studies*, Vol. 64, 1997, pp. 605-654.

[24] Heckman, J., Ichimura, H., Smith, J., & Todd, P., Characterizing selection bias using experimental data, *Econometrica*,Vol. 66, 1998, pp. 1017-1098.

[25] Kaplinsky, R., Technique and system: The spread of Japanese management techniques to developing countries, *The World Development*, Vol. 23, 1995, pp. 57-71.