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The factors improving skill development and skill formation systems in industries: Firm-level analysis of Cambodia's manufacturing industry

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សង្ខិត្តន័យ

ដើម្បីជាការស្វែងយល់ ពីកត្តានានាសម្រាប់កែលម្អការអភិវឌ្ឍជំនាញក្នុងឧស្សាហកម្មកម្មន្តសាល ការសិក្សាបានប្រើវិធីសាស្ត្រស្រាវជ្រាវបែបចម្រុះ ដោយស្ទង់មតិតាមរោងចក្រចំនួន 101 និងសម្ភាសស៊ីជម្រៅចំនួន 36 ជាមួយនាយកដ្ឋានធនធានមនុស្ស និងនាយកដ្ឋានផលិតកម្មរបស់រោងចក្រ។ Binary Logistic Regression Model ត្រូវបានប្រើដើម្បីវិភាគរកទំនាក់ទំនងរវាងការអភិវឌ្ឍជំនាញក្នុងឧស្សាហកម្មកម្មន្តសាល និងកត្តាដែលមានឥទ្ធិពលទាំងប្រាំបី ដែលរួមមាន ការវិនិយោគផ្ទាល់ពីបរទេស ការផ្លាស់ប្តូរផលិតផល ការប្រើប្រាស់បច្ចេកវិទ្យា របៀបធ្វើការងារ ប្រតិបត្តិការលក់ ការនាំចេញ រយៈពេលប្រតិបត្តិការអាជីវកម្ម និងតម្រូវការកម្មករជំនាញបន្ថែមទៀត។ ការវិភាគប្រៀបធៀបបែបគុណវិស័យ (Qualitative Comparative Analysis) ត្រូវបានប្រើដើម្បីបង្ហាញពីប្រព័ន្ធបណ្តុះបណ្តាលជំនាញក្នុងឧស្សាហកម្មកម្មន្តសាល។ លទ្ធផលបានបង្ហាញថា ការអភិវឌ្ឍជំនាញក្នុងវិស័យឧស្សាហកម្មកម្មន្តសាល មានទំនាក់ទំនងជាវិជ្ជមានជាមួយរយៈពេលប្រតិបត្តិការអាជីវកម្ម ការនាំចេញ និងតម្រូវការកម្មករជំនាញបន្ថែមទៀតនៅក្នុងរោងចក្រនីមួយៗ។ លើសពីនេះ ការអភិវឌ្ឍជំនាញតាមរោងចក្រត្រូវស្របតាមអភិបាលកិច្ច គោលបំណងនៃការគ្រប់គ្រង ការទទួលស្គាល់របស់រោងចក្រ និងការចូលរួមរបស់កម្មករផងដែរ។ ហើយការអភិវឌ្ឍជំនាញទៀតសោធត្រូវបានផ្តល់ជូនចំពោះតែបុគ្គលិក ដែលមានជំនាញកម្រិតមធ្យម និងកម្រិតខ្ពស់ប៉ុណ្ណោះ។ តាមលទ្ធផលនៃការស្រាវជ្រាវនេះ អ្នកនិពន្ធបានផ្តល់អនុសាសន៍ឱ្យបង្កើនការចូលរួមរបស់កម្មករក្នុងការអភិវឌ្ឍជំនាញ តាមរោងចក្រដែលមានប្រតិបត្តិការរយៈពេលវែង មានការនាំចេញច្រើន និងត្រូវការកម្មករជំនាញកាន់តែច្រើន រួមជាមួយប្រព័ន្ធលើកទឹកចិត្តដែលជាកត្តាចាំបាច់ក្នុងការអភិវឌ្ឍជំនាញក្នុងឧស្សាហកម្មកម្មន្តសាលឱ្យបានគ្រប់ជ្រុងជ្រោយ។

ABSTRACT

To understand the factors for improving skill development in the manufacturing industry, the study utilized mixed-method research combining surveys and in-depth interviews to collect data from 101 firms. 36 in-depth interviews with the firms' human resources and production departments were carried out. A binary logistic regression model was used to explore the relationships between in-employment skill development and eight influencing factors such as FDI, change in products, technology usage, work organization, sales performance, year of operation, export, and require more skilled workers.

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Qualitative comparative analysis was applied to outline the industry skill formation systems, specifically for medium and high-skilled employees. The results indicate that in-employment skill development is highly likely to be influenced by years in operation, export-oriented production, and the requirement for more skilled workers in individual firms. Furthermore, the skill development in firms is aligned with firm governance, management objectives, recognition, and worker participation. It is acknowledged that in-employment skill development caters to only specific employees, such as medium and high-skill workers. Based on these findings, the study recommends enhancing worker participation in in-employment training with firms that run long-term operations, produce exports, and require more skilled workers; and the study concludes that incentive systems are essential to improving in-employment skill development.

1. Introduction

Since 2002, Cambodia's Manufacturing industry has been developing rapidly due to the visible transformation of the market economy and the international demand for garments (Hughes & Un, 2011). The manufacturing industry is playing a significant role in transforming Cambodia into a middle-income economy by 2030 and a high-income economy by 2050, as stated in the National Strategic Development Plan for 2014-2018 (MoP, 2014). Given the importance of the manufacturing industry (for example, electronics and electrical assembly, garments, and food processing), the Royal Government of Cambodia (RGC) developed the Industrial Development Policy 2015-2025 and the Technical Vocation Education and Training (TVET) Policy 2017-2025 to promote competitive industry and skill development (MISTI, 2015; NTB, 2017). The strategies aligned with the Rectangular Strategy Phase IV 2018-2023, particularly employment, equity, and efficiency goals, by prioritizing human capital development (MFAIC, 2018).

The development agenda has emphasized the critical role of capacity development of Cambodian labor in terms of knowledge, skills, and competencies for the manufacturing industry. Several studies on the contribution of skill development have emerged (MISTI, 2015; NTB, 2017; Khieng et al., 2015; Srinivasa, 2014). The most common agreement of these studies was the conclusion that that skill development is positive for manufacturing expansion. Moreover, the RCG has pointed out that skill development is crucial for developing technology standards (NTB, 2017). Lessons from Japan, Singapore, Taiwan, and South Korea show that these countries are more developed in their manufacturing industries due to improved workforce skill development (Benson et al., 2013). Thus, improving education and skill development enables innovation and transformation in most manufacturing industries which are key to country development (Oke & Fernandes, 2020; Xing & Marwala, 2017; Kruss et al., 2015).

The increased attention on skill development also follows from skill gaps and shortages of Cambodian labor (working-age 15-64) in the manufacturing industries. The National Institute of Statistics (NIS) reported that the workforce population reached 10,068,625 people (MoP, 2019). Nevertheless, only 9% of the workforce completed grade 6, only 8% completed grade 9, only 6% completed grade 12, and only 3% completed a bachelor's degree. Moreover, only 0.2% of the workforce completed technical or vocational pre-secondary (Vocational Certificates), and only 0.4% completed technical or vocational post-secondary. The illiteracy rate has been estimated at 11%. Given the limitations of education and training, the skill gaps and shortages have shaped barriers to manufacturing development. Moreover, the challenges have slowed down progress toward achievement of the United Nations Sustainable Development Goals (SDGs), such as goal 8: Decent Jobs and Economic Growth, and goal 1: Poverty Alleviation.

Numerous studies have investigated the root cause of skill development challenges, specific skill gaps, and shortages (Yok et al., 2019; Seangmean et al., 2015; Richardson, 2011). These studies revealed that a limited role for skill providers, curriculum design, and the adoption of new technologies are the root causes of the skill gaps and skill shortages. Based on Khieng et al. (2015) and Srinivasa (2014), skill gaps and deficiencies have created more employment challenges. Due to the skill gaps and skill shortages, Ven & Veung (2020) revealed that garments, food processing, and electronic and electrical assembly industries could not find medium and high-skill employees suited to meet their requirements. Seangmean et al. (2015) also pointed out that many graduates have worked jobs that do not match with their training. These issues result in slower industrial growth and low competitiveness in the manufacturing industry.

To address skill development challenges, the International Labor Organization (ILO) suggested improving education and skill development to meet the job demand and improve the growth and transformation of the manufacturing industry (ILO, 2013). However, improving education and skill development requires strong skill formation systems that ensure learners have the necessary knowledge and capacity (Benson et al., 2013; Ven & Veung, 2020). With the limited role of skill providers, outdated curriculum design, and slow adoption of new technologies (Yok et al., 2019; Seangmean et al., 2015; Richardson, 2011), formal education and training alone are insufficient to meet these objectives. Thus, education and skill development that prioritizes workplace-based education is considered well suited to improve skill formation systems and meet skill development challenges in the manufacturing industry (UNESCO UIS, 2013).

Evidence indicates that in-employment skill development is a good model for business capacity-building (Sullivan & McIntosh, 1996; UNESCO UNEVOC, 1995). Sullivan & McIntosh (1996) explained that in-employment skill development is a participant-centered approach. It can be on-the-job or in-employment vocational training (UNESCO UNEVOC, 1995). Based on Lewis' Enterprise Skills Training Model applied in Australia (ADB, 2000), the in-employment skill development approach enabled workers to improve task performance, multi-task management, engagement with contingencies, and work environment skills. Secondly, firms would benefit from this training, with outcomes including returns on investment and productivity, meeting customers' flexible demand, and national recognition. Lastly, it improved industry inputs by including training objectives, directing involvement in training standards, flexibility recognition, and informing customers about training and assessment.

In-employment skill development has become significant, while most existing studies viewed skill development as mainstreaming from formal education and training entities such as universities, institutes, and workshops (Khieng et al., 2015; Richardson, 2011; Seangmean et al., 2015; Srinivasa, 2014; Yok et al., 2019), this overlooks informal and non-formal skill development in the manufacturing industry. Thus, this study aims to identify factors that improve in-employment skill development and outline skill formation systems in the manufacturing industry using a conceptual framework adapted from Lewis' Enterprise Skills Training Model (ADB, 2000).

There are three factors that improve in-employment skill development in this study: economic structures, firm performance, and skill development (**Fig.1**). The economic structures of firms, such as foreign direct investment (FDI) and exports, are likely to influence skill demand. Alongside the economic structures, governance in firms is essential to increase and provide for demand for skill development. Firm performance such as product improvement, technology development, work organization, requirements for skilled workers, and sales performance, are likely to shape skill adoption in firm operations. Moreover, business performance under proper management entails matching the skills needed by the firm to training objectives. Finally, skill development includes informal and non-formal education and training in the manufacturing industry. These forms of training require participation from employees and recognition from the industry.

There are various types of non-formal and informal education and training in the manufacturing industry as recognized by UNESCO UIS (2013). Non-formal education and training are defined as an alternative to formal education, and part of lifelong learning processes. It caters to all ages, and it does not need proper structures, a specific duration, or intensity. Typically, non-formal education and training involves workshops, short courses, or seminars that can lead to a qualification but are not officially recognized. These forms of education can

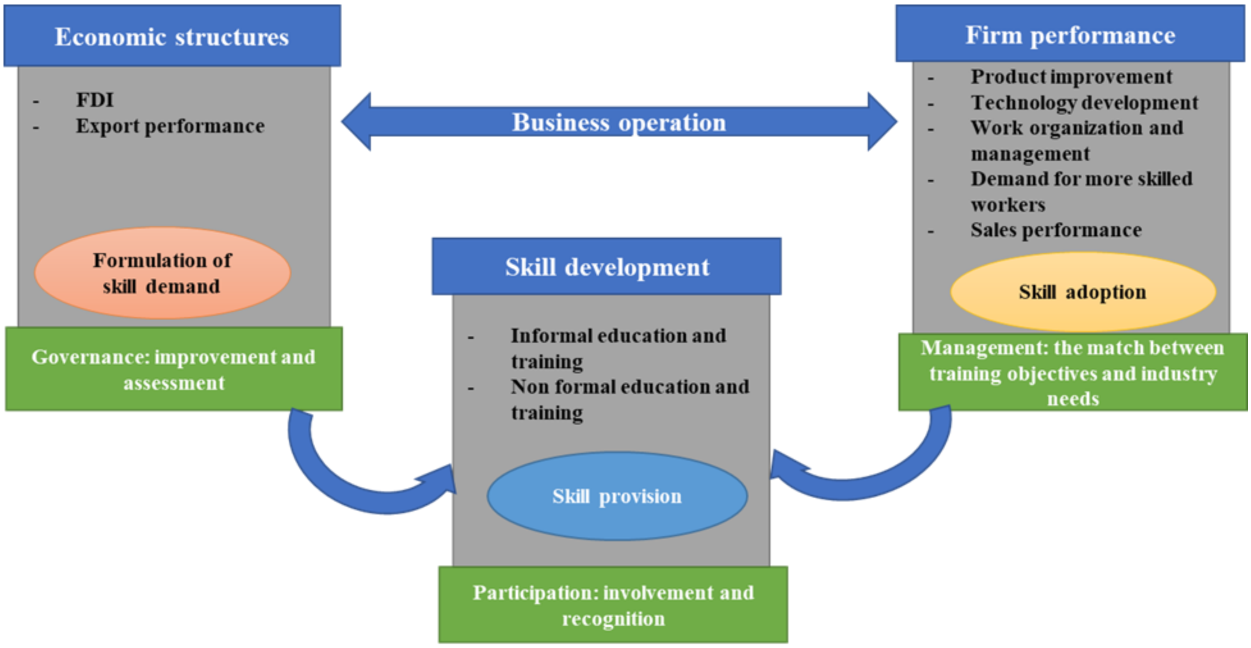

Fig. 1. Conceptual framework of in-employment skill development.
Source: adapted from Lewis' Enterprise Skills Training Model (ADB, 2000)

contribute to adult and youth work skills. However, non-formal education and training are often offered to medium-skill and high-skill employees in large-size firms in an area of industry (OECD, 2013; Rainbird, 2000). In this regard, two types of non-formal education and training were identified in this study. They are non-formal company-based training (NFC) and other non-formal training (OtherNF). NFC refers to short or longer skills programs provided by a firm or company that may lead to industry certification or recognition or to company certification or recognition. Such trainings are structured and intentional. NFC aims primarily at new employees but also can pertain to existing workers. Other trainings could be short courses offered by public and private TVET (Technical and Vocational Education and Training) providers and non-governmental organizations. This type of education or training may lead to provider-based certificates that are not officially recognized.

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Informal education and training are intentional but are not institutionalized (UNESCO UIS, 2011). It includes learning activities in the workplace and business. It could be on a self-directed, work-directed, or socially directed basis. Nguyen et al. 2011 and Thang et al. (2010)

explained that education in the workplace is significant where workers can learn and develop their knowledge through work environments and social interaction. Within business development strategies, workers can be provided informal capacity development in many forms (Ven & Veung, 2020). Four such types of informal education and training were defined, including informal on-the-job training in new technology (Tech), general information on the job training (Onging), induction training (Indu), and work experience programs (Intern). Tech training focuses on how to use new machines. Suppliers of new technology or equipment often provide this type of training linked to new technology or equipment. It is intentional, not certified, but could be formally recognized within a company and is probably a prerequisite for specific tasks. Ongoing is training offered by supervisors or team members on new work tasks. It could be for new entrants or existing workers. Indu is an orientation or induction program that provides a general introduction to the workplace, including health and safety issues. This type of training focuses on new workers. Finally, Intern can be workplace experience programs. It might result in company or industry recognition (**Table 1**).

Formal education institution-based TVET programs (BTVET) are also included in the analysis to investigate the skill formation systems in the manufacturing industry. BTVET are technical and vocational programs, vocational and training programs, and training programs. Recognized education and training institutions offer these programs in relation to a national qualification (Catts et al., 2011). Providers are primarily public but could be private or even international organizations, recognized by the government. Some providers might have integrated work components, including a work experience requirement such as an internship or project implementation at the end of the qualification.

2. Materials and methods

This research uses a mixed-methodology by conducting both surveys at firms and in-depth interviews to investigate factors improving in-employment skill development and outline skill development systems in Cambodia's Manufacturing industry, namely garments (CG), food processing (CF), and electronic and electrical assembly (CE). Noticeably, the CG industries play a significant role

Table 1. Education and training formation. Source: Author's summary

Formation	Programs	Description	Code
Formal	Formal education institution based TVET programs	Refers to programs that officially recognized providers provide in relation to a national qualification.	BTVET
Non-formal	Nonformal company-based training	Short or longer skills programs that lead to industry certification or recognition or company certification or recognition.	NFC
	Other non-formal training	Short courses and other kinds of training that lead to some provider-based certificates but are not officially recognized	OtherNF
Informal	Informal on-the-job training in new technology	Specific training is often provided by suppliers linked to new technology or equipment.	Tech
	General informal on-the-job training	Informal on-the-job training: supervisor or team member offers training on new work or tasks.	Onging
	Induction training	Orientation or induction programs provide a general introduction to the workplace, including health and safety issues.	Indu
	Work experience programs	Workplace experience programs or internships that are learning through working.	Intern

in exports, with a value of about 13.1 billion USD, and contributed approximately 18.2% to GDP growth in 2018 (NIS, 2018). Moreover, this sector creates plenty of employment opportunities for skilled and unskilled local Cambodians. CF is the second-highest manufacturing sector contributing to exports, employment, and GDP growth. It accounted for about 254 million USD in 2018, or about 1.9% of GDP (NIS, 2018). Finally, CE is the fastest-growing manufacturing industry. In 2016, the CE products exported from Cambodia were about 458 million USD, a massive increase compared to 6 million USD in 2012 (Ven & Veung, 2020). As such, selecting these three sectors provides a suitable representation of the manufacturing sector in the Kingdom (**Fig. 2**).

Firstly, firms were divided into capital, border, and sea zones. The country-wide firm survey followed proportional stratified sampling. From these sampling procedures, 254 firms were identified for the target survey to represent the total population of the industries listed. The sample size of 101 was derived with Yammane's (1973) formula, n=N/(1+Ne2) (i.e., N=Population, n=Sample size, e=Tolerance error (7.7% =0.077). Of the 101 firms, 65 were from CG, 20 were from CE, and 16 were from CF. The data from firm surveys was analyzed in descriptive statistics (i.e., mean and standard deviation, and frequency distributions), Spearman's rho correlation, one-way ANOVA, and Binary Logistic Regression (BLR) to reveal factors improving in-employment skill development.

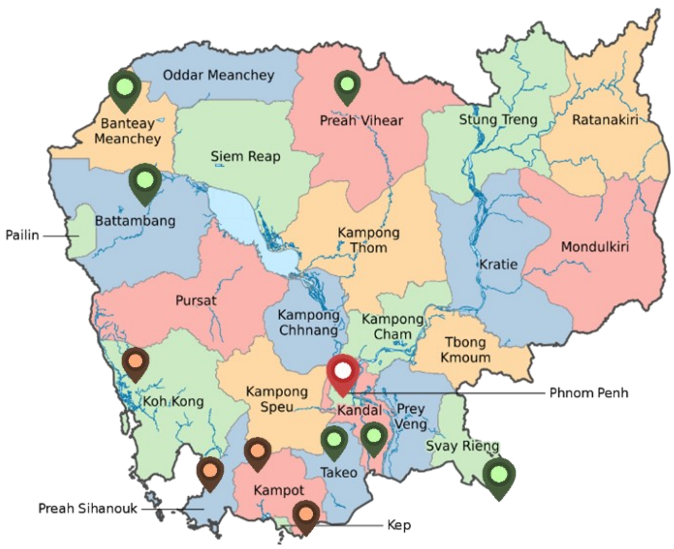


Fig. 2. Map of study sites

At the same time, the study conducted 36 in-depth interviews with human resource and production departments from 18 selected firms among the 101 firms (see list in appendix). Each interview took around 60 and 90 minutes to collect information on in-employment skill development in the manufacturing industry (referred to OECD, 2013; Rainbird, 2000). Each in-depth interview was transcribed from audio records into text. Afterwards, the in-depth interview transcripts were coded in a thematic content table (following the manner recommended by Braun and Clarke, 2006). Then, a cross-case study was employed to score the in-employment skill development from the human resources and production departments. Finally, qualitative comparative analysis (QCA) was applied to outline the industry skill formation systems.

BLR is a nonlinear model with either continuous, discrete, or combination variables that are not necessarily normal distributions (Lee & Pradhan, 2006). The results from the regression predicted the likelihood that a particular factor would contribute to in-employment skill development in firms. The logit distribution constraints estimated the probability as a value between 0 and 1 (Tranmer & Elliot, 2008). A total of eight independent variables were identified based on the conceptual framework (**Appendix 1: Table 1**). The BLR was running with the SPSS 23 software package and analysing the following regression models:

$$\pi_i = \Pr\left(Y_i = \frac{1}{X_i} = x_i\right) = \frac{\exp(\beta_0+\beta_1 x_i)}{1+\exp(\beta_0+\beta_1 x_i)} \quad \textbf{(1)}$$

$$logit(\pi_i) = \log\left(\frac{\pi_i}{\pi_i - 1}\right) = \beta_0+\beta_1 x_i \quad \textbf{(2)}$$

$$logit(\pi_i) = \beta_0+\beta_1 x_{i1} + \cdots + \beta_k x_{kn} \quad \textbf{(3)}$$

Where:

$\pi_i =$ the probability of a firm conducting in-employment training (training = 1, and not training = 0)

β_0 = the constant of the equation

β_{x1-xkn} = the coefficient of the predicting factors

$x =$ the predicting factors: x_1 = *year of operation*, x_2 = *FDI*, x_3 = *Export performance*,

x_4 = *Require more skilled workers*, x_5 = *Change_product*, x_6 = *Change_tech*, x_7 = *Change_org*, x_8 = *Sales performance*

Thresholds recommended by Hair et al. (2014) and Leech et al. (2014) to assess the significance of various factors in improving in-employment education and training in the three industries; included significance levels (*p*-value <.05), Wald Statistics (x^2>2) and Cox & Snell (R^2 <0.05). The results from G*Power also confirmed that the BLR has enough power for estimating the significant coefficient with the minimum sample size of 61 firms required for actual power 95 (Faul et al., 2007). Thus, the valid cases of 89 firms out of 101 total firms included in the BLR were enough to estimate the coefficient in the regression model.

2.1 Qualitative comparative analysis (QCA)

Improving training facilities and increasing skill development programs lead to progressive work organization (Adworkorga), resulting in better product advancement, productivity, and business investment returns (ADB, 2000). Therefore, this study outlined skill formation systems by including training facilities and skill formations as input conditions and Adworkorga as an outcome. This study classified seven skill formations, including: (1) BTVET, (2) NFC, (3) OtherNF, (4) Tech, (5) Onging, (6) Indu, and (7) Intern. The above seven key skill formations were developed on a measurement scale from 1 to 4, which referred to 1 = not at all; 2 = not very important; 3 = quite important, and 4 = very important to advanced work organization. However, scores 1 and 2 represent the negative, and 3 and 4 represent the positive toward Adworkorga. Then, the researcher decided to use the number 3 as the cross-cut point in the Fuzzy Sets calibration. In addition, training facilities and Adworkorga are Crisp sets. Therefore, Crisp sets were calibrated into 0 and 1, and the Fuzzy sets were calibrated in the model below **(Appendix 2: Table 2)**:

$$Fuzzy\ calibration\ \ (x, n_1 = 4, n_2 = 3, n_3 = 1) \quad \textbf{(4)}$$

The Fuzzy and Crisp sets were analyzed in fsQCA software version 3.1b (Ragin, Charles C., and Sean Davey, 2016). The author ran condition and outcome variables into the actual table analysis, taking Adworkorga as the outcome and the seven skill formations and training facilities as the input conditions, by showing solution cases in output firm codes **(Appendix 3,4, 5: Table 3,4,5)**.

- Medium-skill employee skill formation systems: *Adworkorga = (facilities, BTVE, NFC, OtherNF, Tech, Onging, Indu, Intern)* (5)
- *Algorithm: Quine-McCluskey, frequency cutoff: 1, consistency cutoff: 0.86*
- High-skill employee skill formation systems: *Adworkorga = (facilities, BTVET, NFC, OtherNF, Tech, Onging, Indu, Intern)* (6)
- *Algorithm: Quine-McCluskey, frequency cutoff: 1, consistency cutoff: 0.95*

Logical minimization was used to delete rows with numbers less than 0.8 and set Adworkorga to 1 for the rows with consistency equal to or greater than 0.8. Finally, the author conducted the standard analysis of the intermediate solution using the present and absent causal conditions of each input variable.

3. Results and discussion

3.1 Economic structures, sales performance, and skill provisions

The following sections present the economic structures, business performances, and skill provisions of firms from the three leading sectors: CE, CG, and CF manufacturing industries. The study found that the three manufacturing industries have been operating in Cambodia on average for ten years; CF and CG were running earlier (M = 10.88 years, SD = 8.0 years) and (M = 7.5 years, SD = 4.6 years), and CE was the comparatively emerging sector (M = 5 years, SD = 2.15 years). These manufacturing sectors were mainly FDI driven with more than 66% share of the investment capital being foreign funds, and the destination markets for their products were primarily international. CE and CG exported almost

100% of products (garments and electronic and electrical goods) to international markets such as the United States, Europe, and Japan (CE exported 100% and CG exported 95.3%). In comparison, CF processed foods for the local market and exported only 18.8% of produced goods. Export performance was related to international demand and preferential markets **(Fig.3)**.

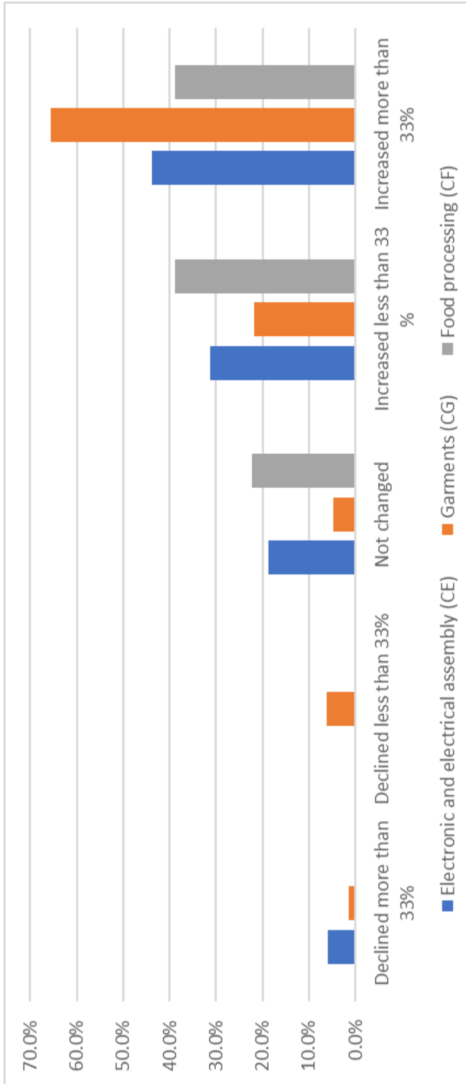


Fig. 3. Sales performance by industry sector in the last 5 years (%)
Source: author's calculation

In the last five years (2012-2017), the sales performance of firms has been confirmed to be rapidly increasing. 65.6% of CG, 38.9% of CE, and 43.8% of CF firms reported sales increase of more than 33%. About 7% of the total firms (101 firms in total) reported a decline in sales in the last five years more than 33% and about 7% of the total firms reported a decline less than 33%. The positive increase in sales was the result of more demand and improvements in production and technology use in the manufacturing industry.

Spearman's rho correlation was used to confirm the relationships between sales performance in the last five years and business performance, in terms of advancements in products and technologies and requirement for skilled workers in the three industries. **Table 2** shows a significant positive correlation between positive sales performance and the requirement for more skilled workers in the respondent firms). Furthermore, the results proved that when firms advanced their product development, the firms' demand for more advanced technologies increased. Also, when firms had more advanced technologies , they required more skilled workers). Thus, business performance requiring more skilled workers was positively correlated with advancing the use of technology usage and improving sales performance.

Regarding the positive correlation between firm performance and the requirement for more skilled workers, the study then sought to examine the in-employment education and training conducted in the three manufacturing industries.

Table 2: Spearman's rho correlation results using sales performance and firm performance

Firm performance	Sales performance	Advancing in products	Advancing in technology use	Requiring more skilled workers
Sales performance	1.000	.009	.043	.254*
Advancing in products		1.000	.410**	.029
Advancing in technology use			1.000	.244*

. Correlation is significant at the 0.05 level (2-tailed)

****. Correlation is significant at the 0.01 level (2-tailed)***

Table 3 shows no statistically significant difference between in-employment education and training in CE, CF, and CG firms. However, in employment education and training programs showed high variation (CE=7, CF=16, CG=30). Firms mainly provided supervisory skills, quality management, quality control, and electricity management. For example, CE firms provide in-employment training such as Solidworks, technical training, and sequence control in PLC systems; CG firms cater to electrical wiring skills, occupational safety, quality control, and electricity management; and CF firms provide training on food engineering, training on pre-harvest and post-harvest techniques and technologies, agricultural waste management, and the use of biotechnology. These in-employment skill developments were industry-specific and involved self-assessment. In general, these training programs were provided by technicians and supervisors to their supervisory staff, and included: formal or informal on-the-job training on new technologies, general information on the job training, induction training, and work experience programs (Internships).

The results indicated a lesser amount of in-employment education and training in manufacturing industries (CE=7, CF=16, CG=30). These education and training programs are claimed to be essential for task performance skills, managing multiple tasks, contingency skills, and work environment skills (ADB, 2000). The existing studies found that in-employment education and training are often selectively offered to medium-skill and high-skill employees in large firms (OECD, 2013; Rainbird, 2000), and are not provided to general workers.

This was likely because of three reasons. First, general workers were employed to work in low-value-added jobs. Second, provision of training for general workers is costly. And finally, it is time-consuming because general workers have limited foundational knowledge and low absorption capacity.

3.2 Factors improving in-employment skill development in the industries

Given, , P<.001 suggests that between 29% and 40% of the variance could be explained by the eight independent variables. It was supported by a Hosmer and Lemeshow Test, which gave the , *P*>0.05. The threshold value of 0.500 predicted a percentage of agreement with the model of 78.7% (PAC=78.7%), with a possible error of only 21.3%. Detailed results from this statistical model are shown in Table 4, including a coefficient (B), the standard error related to the coefficient (SE), the Wald Statistic = [B/S.E.]2, the number of degrees of freedom (d.f.), the significance level of the coefficient (Sig), and the odds ratio of the individual coefficient Exp(B).

Among eight influencing factors, three have significantly and positively influenced in-employment skill development in the three industries. The findings indicate that the year of operation significantly influenced in-employment skill development (which meant that firms that had been operating longer (for every 1-year increase) were more likely to increase in-employment skill development by approximately 1.1 times. Moreover, firms that required more skilled workers (for every 1 level increase in

Table 3. One-way ANOVA results using industry sectors as the criterion of skill provision

Skill provisions		Sum of Squares	df	Mean Square	F	Sig.
In-employment education and training	Between Groups	4.484	2	2.242	1.950	.148
	Within Groups	112.704	98	1.150		
	Total	117.188	100			

F-value ≥ 4 and significant of *p*-value<0.05 (Hair et al., 2014).

Source: author's calculation

Table 4: Factors influencing in-employment skill improvement in the industries. Source: author's calculation

	B	S.E.	Wald	df	Sig.	Exp(B)
Year of operation	.144	.067	4.579	1	**.032**	1.155
Change in products	.796	.517	2.368	1	.124	2.216
Change in technology usage	-.065	.606	.011	1	.915	.937
Change in work organization	-.117	.466	.063	1	.802	.890
Requiring more skilled workers	1.409	.626	5.067	1	**.024**	4.092
Sales performance	-.516	.302	2.925	1	.087	.597
Export performance in the last 5 years	1.139	.513	4.919	1	**.027**	3.123
FDI	-1.612	.881	3.343	1	.067	.200
Constant	-2.257	2.821	.640	1	.424	.105

requiring more skilled workers) were more likely to enhance in-employment skill development by 4 times. Finally, firms with more exports to the international market for every 1 level increase in export were likely to improve in-employment education and training for their staff by 3.1 times These results showed that the firms with long-term business operations, export-oriented production, and a need for more skilled workers were positively focused on in-employment skill development, including both upskilling and reskilling.

The other factors such as FDI, change in products, change in technology use, change in work organization, and sales performance were not found to significantly statistically correlate with in-employment skill development in the three manufacturing industries. Suppose firms are small and more recently begin operations, with a minimal requirement for skilled workers and no export-oriented production. In such cases, it could mean no significant improvement in in-employment skill development despite changes in products, technology use, work organization, and sales performance.

According to the Lewis' Enterprise Skills Training Model (ADB, 2000), in-employment skill development would also be framed by governance, management, and participation and recognition within individual firms. The interview data explained these frames of influence frames below.

Governance: despite changes in products, technology use, and work organization, in-employment skill development was highly related to a firm's governance, especially in FDI-based and export-oriented businesses. Most FDI-based firms in the study explained that the changes were introduced and facilitated by their parent companies overseas. Moreover, new machinery and technologies were mostly introduced by and provided training for by suppliers, with training given to specific technicians in the firms. On the other hand, installing new types of machinery, technologies, and new product designs required high levels of specific skills and knowledge, for which training could not be provided to existing employees, even medium and high-skilled workers. Only knowledge and skills required by firm production and buyer requirements (for export) within a given timeframe were able to be imparted to employees. For example, knowledge on how to produce new brands of clothing, new types of electrical motors, and new food products. These types of training were given to employees, but framed by skill formulation demands identified by the production department and human resource strategies of the firms. Thus, enhanced in-employment skills and knowledge of employees were to some extent related to firm governance decisions that calculated skill demands and created the capability of offering skill augmentation in the firms.

Management: changes in technology use, types of product, and work organization create the requirement more in-employment skills and knowledge. However, training objectives needed to match industry needs. The interview data indicated that most manufacturing industries improved in-employment skill development through on-the-job training and work experience, emphasizing learning by doing. These capacity-building methods were believed to benefit the firms by enhancing production and meeting flexible buyer demand. And these types of training were also confirmed to enable workers to improve performance of task-related skills, multi-tasking, contingency skills, and work environment skills, which led to better productivity. So, training objectives bridged capacity building and company benefits. Therefore, in-employment skill development is also highly dependent on management objectives.

Participation and recognition: in addition to changes in technology use, product types, and work organization, in-employment skill developments were also related to worker participation and recognition by firms. Providing more in-employment training programs to existing employees could also affect them physically or emotionally. More capacity developments were viewed as positive, but increased numbers of training were also considered to increase the workload and responsibilities for workers. So, a positive mindset of workers toward skill development was essential for participating in capacity development. Moreover, recognition of capacity building by workers from firms was considered the key motivating factor for workers to participate in capacity development. Firms should motivate skill development by improving reward systems, bonuses, and promotions in order to enhance employee participation and improve in-employment skill development.

3.3 Skill formation systems in the three manufacturing industries

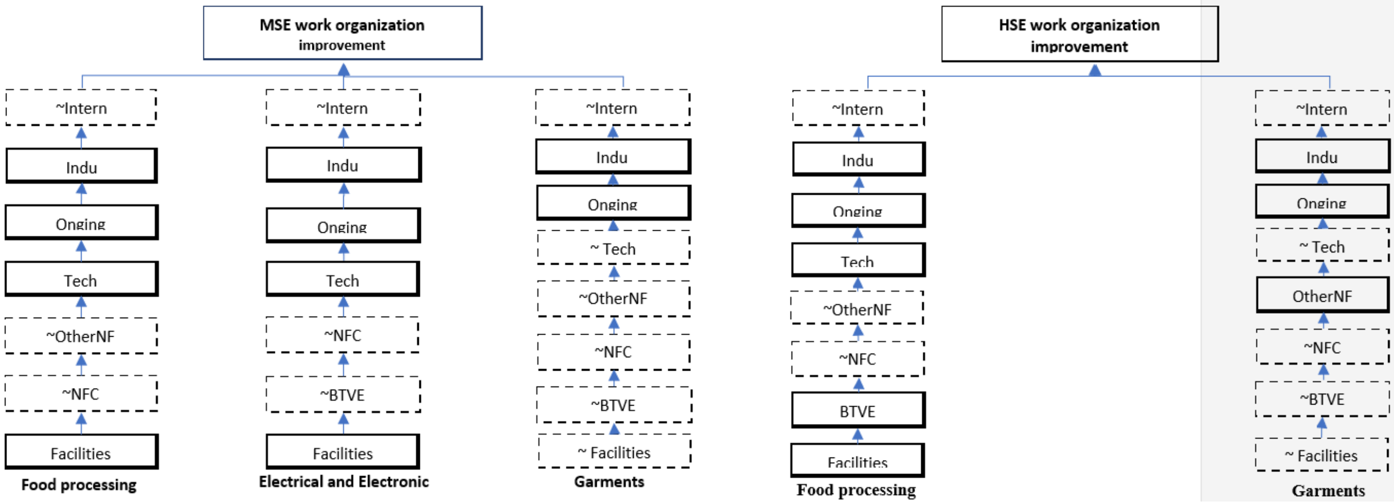
The result from the QCA revealed skill formation systems for medium and high-skilled employees. The medium-skilled employees were provided in-employment education and training by three skill formation systems. In the first system, firms provided training on new technology (Tech), general training on jobs (Onging), and induction training (Indu). These training programs were delivered in firms with proper training facilities. Non-formal company-based training (NFC), other non-formal training (OtherNF), and work experience programs (Intern) were partially included in the first skill formation system (facilities*~NFC*~OtherNF*Tech*Onging*Indu*~Inter). This kind of skill formation system was used in the food processing industry. In the second skill formation system, firms provided Tech, Onging, and Indu training to workers with full training facilities. This system was also comprised of formal education institution-based programs (BTVET), non-formal company-based training (NFC), and work experience programs (Intern), but they were not fully included in the system (facilities *~BTVE*~NFC*Tech*Onging*Indu*~Intern). This training system was applied by the electrical and electronic assembly industry. In the last skill formation system, firms provided only Onging and Indu training to staff without proper training facilities. In the formation system (~facilities*~BTVE*~NFC*~OtherNF*~Tech*Onging*Indu*~Intern) training centered on new workers with low value-added tasks. It aimed to improve work experience, work environment, and safety. Firms in the garment industry used this system.

High-skilled employees were provided in-employment education and training in two systems. In the first such system, firms catered to non-formal company-based training (NFC), Onging, and Indu without any facilities: (~facilities*~BTVET*~NFC*OtherNF*~Tech*Onging *Indu*~Intern). The garment industry applied this skill formation system. Lastly, firms catered to formal education institution-based programs (BTVET), training on new technology (Tech), general training on jobs (Onging), and induction training (Indu) with full training facilities: (facilities*BTVET*~NFC*~OtherNF*Tech*Onging* Indu*~Intern). This training system was applied by the food industry. Noticeably, the skill formation system of high-skilled employees from the electronic and electrical industry was unable to be identified, due to insufficient data **(Table 5)**.

Table 5: Skill formation systems in the industries

* present, or ~absent - Consistency threshold: 0.7 - Raw Coverage: 0.3 or more -Unique coverage: no threshold on the raw coverage; it should be 0.01 or more

	Skill System	Fact	BTVET	NFC	Other NF	Tech	Onging	Indu	Intern	Raw	Uniq	Consistency	Solution coverage	Solution consistency
MSE	facilities*~NFC*~OtherNF*Tech*Onging*Indu*~Intern	•		o	O	•	•	•	o	0.362	0.081	0.908	0.589	0.936
	facilities*~BTVE*~NFC*Tech*Onging*Indu*~Intern	•	o	o		•	•	•	o	0.413	0.132	0.918		
	~facilities*~BTVE*~NFC*~OtherNF*~Tech*Onging*Indu*~Intern	o	o	o	O	o	•	•	o	0.094	0.094	0.965		
HSE	~facilities*~BTVET*~NFC*OtherNF*~Tech*Onging*Indu*~Intern	o	o	o	•	o	•	•	o	0.133	0.133	0.975	0.427	0.958
	facilities*BTVET*~NFC*~OtherNF*Tech*Onging*Indu*~Intern	•	•	o	O	•	•	•	o	0.294	0.294	0.950		



3.4 The importance of export-oriented production for skill development

The study revealed significant improvement in in-employment skill development by increasing exports to international markets ($p<0.05$,odds ratio 3.123). The result may be explained by the fact that exporting to international markets requires advanced products with high quality that demand advanced skills/knowledge and modern technologies to produce. The study result explained the importance of international exports for skill development because when firms advanced production, it positively correlated with the need for modern technologies ($r(97)=.410, p<0.01$). Also, when firms increased use of more advanced technologies, firms required more skilled workers ($r(89)= .244, p<0.05$). It is interesting to note that the firms that required more skilled workers were highly likely to enhance in-employment skill development at their company ($p<0.05$,odds ratio 4.092). So, the in-employment skill development is demand-based training, specifically catering to meeting buyers' flexible demand for products. Through this demand-based training, firms can build worker capacity to enhance productivity and meet the buyer demand, which matches well with firm governance, management objectives, and training delivery (ADB, 2000). This agrees with the conclusions of ADB, 2000; Sullivan & McIntosh, 1996; UNESCO UNEVOC, 1995 that found improved in-employment education and training enables firms to be more flexible in production. It can thus be confirmed that export-oriented production is an essential factor in improving in-employment skill development in the manufacturing industry.

3.5 Roles of length of operations of firms for significant influenced on in-employment skill development

The study also found that the number years of firm operations significantly influenced in-employment skill development ($p<0.05$,odds ratio 1.155). The more extended firm operations were, the more likely the firm was to increase in-employment training for workers. This could be explained by the long-term growth and transformation of firm investment objectives. To meet sustainable development, most firms need to build an internal capacity for upskilling and reskilling their workers (NTB, 2017). This has been confirmed by Ven & Veung (2020) that education and skill development positively correlate to firm growth and transformation. As well, improving in-employment skill development enabled workers to learn to work with new machines and tools (Oke & Fernandes, 2020; Xing & Marwala, 2017; Kruss et al., 2015).

Meanwhile, the firms that operated for a longer time that use modern machines for growth and transformation faced a challenge to recruit technical staff with suitable knowledge and experience to operate the machines (Ven & Veung, 2020). The findings of this study suggest that offering in-employment knowledge and skill building that emphasizes learning by doing with peer interaction is well suited for overcoming skills gaps. For instance, the best way to improve in-employment skill development is to enhance participation of workers and firm recognition. Building a positive mindset toward skill development is essential, and creating incentive systems such as rewards, bonuses, and promotions for the learner is the motivating factor for long-term skill development in firms that have been operating for a long time.

3.6 In-employment skill development in Cambodia

In-employment skill development in Cambodia is more likely with export-oriented production, a greater length of time in operation, and the requirement for more skilled workers. In-employment skill development is related to an individual firm's governance, management objectives, worker participation, and recognition. Interestingly, in-employment skill development caters to specific employees, such as medium and high-skilled workers (OECD, 2013; Rainbird, 2000). The medium-skilled workers are offered technology training, informal on-the-job training, and induction training with proper training facilities. And the high-skilled workers are provided with TVET-based training programs, non-formal company -based training, technology training, ongoing work experience, and induction training with proper training facilities. These skill formation systems served primarily to enhance work performance in routine businesses with substantial adoption of new technologies, organizational change, and product advancements. However, in-employment skill development on technical knowledge and skills for general workers is on the priority list for most firms. It could be explained by three factors: low-value-added tasks, training costs, and limited foundational knowledge of general workers.

4. Conclusion

Given the importance of education and skill development, and the priority on workplace-based education to solve skill development challenges in the manufacturing industry, it is critical to understand the relationship between in-employment skill development and key influencing factors in the operation of firms. This study utilized mixed-methodology research involving surveys and in-depth interviews to collect data from 101 firms and 36 in-depth interviews with firms' human resource and production departments. A binary logistic regression model was used to explore the relationships between in-employment skill development and the eight influencing factors such as FDI, change in products, technology use, work organization, sales performance, years in operation, export-oriented production, and the requirement of more skilled workers. Also, qualitative comparative analysis was applied to outline the industry skill formation systems, specifically for medium and high-skilled employees. The results from this study expand our knowledge on key factors improving in-employment skill development and skill formation systems that cater to medium and high-skilled employees in the manufacturing industry. The results can be used to inform manufacturing owners and skill development practitioners about factors that improve skills and knowledge development in the operating business.

The study's most significant findings indicate that in-employment skill development is likely to be significantly influenced by a firm's years in operation, export-oriented production, and need for more skilled workers. However, FDI, product changes, technology use, work organization, and sales performance do not significantly influence in-employment skill development. The skill development in firms seems to align with firm governance, management objectives, recognition of workers, and participation by workers. It is interesting that in-employment skill development caters to specific groups of employees, such as medium-skilled and high-skilled workers only. The medium-skilled workers are offered technology training, ongoing work experience, and induction training with proper training facilities. And the high-skill workers increase capacity through TVET-based training programs, non-formal company-based training, technology training, ongoing work experience, and induction training with proper training facilities.

The study supports the findings of other studies, suggesting that improvements of in-employment skill development benefits both capacity development and firm growth and advancement (Oke & Fernandes, 2020; Xing & Marwala, 2017; Kruss et al., 2015). Firms can build worker capacity to enhance productivity and meet buyer demands through matching firm governance, management objectives, and training delivery (ADB, 2000). The results of this study also align with other studies (ADB, 2000; Sullivan & McIntosh, 1996; UNESCO UNEVOC, 1995) which concluded that that improved in-employment education and training enables firms to be more flexible in production. The study suggests that enhanced participation from workers and improved firm recognition of increased skills are essential to improve in-employment skill development in individual firms. Fostering workers' positive disposition toward skill development and creating incentive systems are the keys to in-employment skill development.

At the same time, the benefits of in-employment education and training can lower training costs and increase capacity building, which will contribute to the Industrial Development Policy 2015-2025 and the Technical Vocation Education and Training Policy 2017-2025, which aim to promote competitive industry and skill development. Therefore, critical recommendations should be given more consideration. Firstly, quality assurance of in-employment training programs should be seriously defined and included in Cambodia's industrial policies, TVET rules, and regulations. Secondly, nationally recognized skill development in industries should integrate training delivery, assessment, and competency standards for generic workplace skills. Finally, enhancing in-employment education and training in the manufacturing industry turns the actual workplace into an employee skill classroom with incentive systems.

While the present research has important implications for improving in-employment skill development in the manufacturing industry, it still has limitations. By adapting Lewis' Enterprise Skills Training Model in Australia, we only examined eight key influencing factors in the regression model and framed them by governance, management, participation, and recognition. The context of workers driving them in the direction of in-employment skill development were not sufficiently understood, especially in terms of fundamental education and motivational factors. Further research is encouraged to investigate the education background and motivational aspects of workers making them more suitable for in-employment skill development and skill formation systems in the manufacturing industry.

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Declaration of competing interest

The author declare that he has no competing interests.

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Appendix

Appendix 1: **Table 1.** Variables included in the Binary Logistic Regression

Independent variables	Description	Code
β_1= year of operation	Age from establishment until 2019	Numerical data
β_2= FDI	The extent of foreign sources in company investment	Ordinal data 0. None 1. Less than 33% 2. Between 33% to 66% 3. More than 66%
β_3= Export performance	Exported product share of the total products	Ordinal data 0. Do not export 1. Less than 33% 2. Between 33% to 66% 3. More than 66%
β_4= Requiring more skilled workers	Need for more skilled workers	Ordinal data -2. Significantly less worker skills -1. Somewhat less worker skills 0. Same worker skills as before 1. Somewhat more advanced worker skills 2. Significantly more advanced worker skills
β_5=Change_product	During the last five years, the number of products made	Ordinal data -2. Become significantly simpler -1. Become somewhat significantly simpler 0. Not changed 1. Become somewhat more advanced 2. Become significantly more advanced
β_6= Change_tech	During the last five years, the different technology and machinery used for production	Ordinal data -2. Become significantly simpler -1. Become somewhat significantly simpler 0. Not changed 1. Become somewhat more advanced 2. Become significantly more advanced
β_7= Change_org	During the last five years, changes to work organization and management	Ordinal data -1. No 1. Yes
β_8= Sales performance	During the last five years, the amount of sales	Ordinal data -2. Declined more than 33% -1. Declined less than 33% 0. Not changed 1. Increased less than 33 % 2. Increased more than 33%

Appendix 2: Table 2. A thematic content table of skill development for both MSE and HSE

1 = not at all; 2 = not very important; 3 = somewhat important; 4 = very important

Code	Ad work orga	Facility	HSE capacity building							MSE capacity building						
			B TVET	*NFC*	*Other NF*	*Tech*	*On ging*	*Indu*	*Intern*	*B TVET*	*NFC*	*Other NF*	*Tech*	*On ging*	*Indu*	*Intern*
cgf	yes	no	3	1	3	3	4	4	1	4	2	2	4	4	3	1
cg3	yes	no	1	1	4	1	4	4	1	4	2	2	4	4	4	2
cgc	yes	yes	3	1	3	2	2	2	1	3	1	4	4	4	3	1
cg0	yes	yes	4	1	3	3	3	4	1	3	1	4	4	4	4	1
cgf	yes	yes	1	1	2	4	4	4	1	3	1	2	4	4	4	2
cg0	no	no	2	1	1	4	4	4	1	2	1	3	3	3	4	1
ce0	no	yes	2	1	1	4	4	4	1	2	1	1	4	4	4	1
cef	yes	yes	3	3	3	4	3	4	1	2	1	3	4	4	3	1
ce1	yes	yes	4	1	3	4	4	4	1	2	1	4	4	4	4	1
ced	no	yes	1	2	2	3	4	4	1	2	1	2	1	4	4	1
cef	yes	yes	2	1	3	3	4	4	1	2	2	2	4	4	4	1
ce3	yes	yes	2	1	3	3	4	4	1	2	1	3	4	4	4	1
cf5	yes	no	4	3	4	4	4	4	2	2	1	1	4	4	3	1
cf1	yes	yes	4	3	3	3	3	3	1	2	1	2	4	4	4	1
cfc	yes	no	2	1	3	3	3	3	1	2	1	2	4	4	4	2
cf3	yes	yes	3	2	2	4	4	4	1	1	1	2	2	4	4	1
cf6	yes	yes	4	2	2	4	4	4	2	1	1	1	3	4	4	1
cfe	yes	yes	3	1	2	4	4	4	2	1	1	3	3	4	3	1

Appendix 3: Table 3. Calibration table

Code	Ad work orga	Facility	HSE capacity building							MSE capacity building						
			B TVET	*NFC*	*Other NF*	*Tech*	*On ging*	*Indu*	*Intern*	*B TVET*	*NFC*	*Other NF*	*Tech*	*On ging*	*Indu*	*Intern*
cgf	1	0	0.5	0.05	0.5	0.5	0.95	0.95	0.05	0.95	0.18	0.18	0.95	0.95	0.5	0.05
cg3	1	0	0.05	0.05	0.95	0.05	0.95	0.95	0.05	0.95	0.18	0.18	0.95	0.95	0.95	0.18
cgc	1	1	0.5	0.05	0.5	0.18	0.18	0.18	0.05	0.5	0.05	0.95	0.95	0.95	0.5	0.05
cg0	1	1	0.95	0.05	0.5	0.5	0.5	0.95	0.05	0.5	0.05	0.95	0.95	0.95	0.95	0.05
cgf	1	1	0.05	0.05	0.18	0.95	0.95	0.95	0.05	0.5	0.05	0.18	0.95	0.95	0.95	0.18
cg0	0	0	0.18	0.05	0.05	0.95	0.95	0.95	0.05	0.18	0.05	0.5	0.5	0.5	0.95	0.05
ce0	0	1	0.18	0.05	0.05	0.95	0.95	0.95	0.05	0.18	0.05	0.05	0.95	0.95	0.95	0.05
cef	1	1	0.5	0.5	0.5	0.95	0.5	0.95	0.05	0.18	0.05	0.5	0.95	0.95	0.5	0.05
ce1	1	1	0.95	0.05	0.5	0.95	0.95	0.95	0.05	0.18	0.05	0.95	0.95	0.95	0.95	0.05
ced	0	1	0.05	0.18	0.18	0.5	0.95	0.95	0.05	0.18	0.05	0.18	0.05	0.95	0.95	0.05
cef	1	1	0.18	0.05	0.5	0.5	0.95	0.95	0.05	0.18	0.18	0.18	0.95	0.95	0.95	0.05
ce3	1	1	0.18	0.05	0.5	0.5	0.95	0.95	0.05	0.18	0.05	0.5	0.95	0.95	0.95	0.05
cf5	1	0	0.95	0.5	0.95	0.95	0.95	0.95	0.18	0.18	0.05	0.05	0.95	0.95	0.5	0.05
cf1	1	1	0.95	0.5	0.5	0.5	0.5	0.5	0.05	0.18	0.05	0.18	0.95	0.95	0.95	0.05
cfc	1	0	0.18	0.05	0.5	0.5	0.5	0.5	0.05	0.18	0.05	0.18	0.95	0.95	0.95	0.18
cf3	1	1	0.5	0.18	0.18	0.95	0.95	0.95	0.05	0.05	0.05	0.18	0.18	0.95	0.95	0.05
cf6	1	1	0.95	0.18	0.18	0.95	0.95	0.95	0.18	0.05	0.05	0.05	0.5	0.95	0.95	0.05
cfe	1	1	0.5	0.05	0.18	0.95	0.95	0.95	0.18	0.05	0.05	0.5	0.5	0.95	0.5	0.05

Appendix 4: Table 4. Surveyed firms

N	Firm ID	Sector	Year of operation	Consent
1	CE051218D	CE	2013	OK
2	CE13E1E5	CE	2017	OK
3	CE14894C	CE	2016	OK
4	CE163E8	CE	2013	OK
5	CE166E20	CE	2017	OK
6	CE18767C	CE	2016	OK
7	CE1AB51F	CE	2012	OK
8	CE1BD4F	CE	2012	OK
9	CE36543	CE	2017	OK
10	CE3A7FC	CE	2017	OK
11	CE3C89A	CE	2015	OK
12	CE435B6	CE	2012	OK
13	CE4771	CE	2011	OK
14	CE518AD	CE	2016	OK
15	CE5913F	CE	2012	OK
16	CE72D5	CE	2012	OK
17	CE830EC	CE	2012	OK
18	CEB043	CE	2014	OK
19	CEF3D5	CE	2012	OK
20	CEGOT20181220	CE	2014	OK
21	CF1	CF	2016	OK
22	CF10395	CF	2009	OK
23	CF125571	CF	2001	OK
24	CF13E0AE	CF	2011	OK
25	CF1AEE37	CF	2017	OK
26	CF1C31F	CF	2012	OK
27	CF20190110KFP	CF	2014	OK
28	CF248C	CF	2016	OK
29	CF27CC50	CF	1993	OK
30	CF3	CF	2014	OK
31	CF8D79A	CF	1995	OK
32	CF9C72	CF	2010	OK
33	CFC0BB6	CF	2015	OK
34	CFCP20181212	CF	1996	OK
35	CFE45EE	CF	2002	OK
36	CFF5154	CF	2009	OK

37	CG1099F	CG	2013	OK
38	CG10DAF	CG	2012	OK
39	CG14FDC	CG	2016	OK
40	CG153	CG	2006	OK
41	CG16903	CG	1997	OK
42	CG1B43B	CG	2014	OK
43	CG1C57	CG	2014	OK
44	CG1D677	CG	2011	OK
45	CG1DBE4	CG	1996	OK
46	CG226B5	CG	2014	OK
47	CG259C9	CG	2011	OK
48	CG28469	CG	2013	OK
49	CG38906	CG	2015	OK
50	CG4390B	CG	2015	OK
51	CG4F7A	CG	2012	OK
52	CG4FE6D	CG	2000	OK
53	CG51B83	CG	2002	OK
54	CG53B	CG	2012	OK
55	CG5DE5B	CG	2012	OK
56	CG6O1A7	CG	2012	OK
57	CG71071	CG	2014	OK
58	CG72F08	CG	2012	OK
59	CG79FB5	CG	2012	OK
60	CG7AD7E	CG	2015	OK
61	CG8258E	CG	2015	OK
62	CG8E5CC	CG	2012	OK
63	CG955E	CG	2013	OK
64	CG9ADAC	CG	2014	OK
65	CG9CECC	CG	2012	OK
66	CG9DAA	CG	2016	OK
67	CG9E77	CG	1998	OK
68	CGA43EA	CG	2013	OK
69	CGA6071	CG	2005	OK
70	CGA7E0D	CG	2010	OK
71	CGAD22F	CG	2013	OK
72	CGB19DA	CG	2016	OK
73	CGB5E23	CG	2013	OK

74	CGBB3D3	CG	2012	OK
75	CGBBEBC	CG	2012	OK
76	CGBC830	CG	2016	OK
77	CGCE4F	CG	2013	OK
78	CGCGU20181219	CG	2011	OK
79	CGD2915	CG	2005	OK
80	CGDA71A	CG	2017	OK
81	CGDA9F9	CG	2004	OK
82	CGE13D2	CG	2015	OK
83	CGE4B	CG	2012	OK
84	CGE513F	CG	2013	OK
85	CGE6B11	CG	2014	OK
86	CGE86C5	CG	2006	OK
87	CGE8B8B	CG	2013	OK
88	CGE8F32	CG	2015	OK
89	CGEAB22	CG	2013	OK
90	CGF1422	CG	2014	OK
91	CGF1BFD	CG	2011	OK
92	CGF21EF	CG	2010	OK
93	CGF2441	CG	2011	OK
94	CGFO4AE	CG	2011	OK
95	CGHWP20181221	CG	2010	OK
96	CGJF20181228	CG	2014	OK
97	CGMT20181229	CG	2016	OK
98	CGSES20181221	CG	2016	OK
99	CGSZYY20181220	CG	2015	OK
100	CGXD20181228	CG	2015	OK
101	CGhongdou20181219	CG	2011	OK

Appendix 5: Table 5. Interviewed firms

N	Firm ID	Sector	Production Department	HR Department	Interview Date	Consent
1	CG16903	CG	☑	☑	25-Nov-19	ok
2	CE1BD4F	CE	☑	☑	26-Nov-19	ok
3	CGF21EF	CG	☑	☑	26-Nov-19	ok
4	CGBBEBC	CG	☑	☑	12-Dec-19	ok
5	CF125571	CF	☑	☑	20-Nov-19	ok
6	CF3	CF	☑	☑	18-Nov-19	ok
7	CGBC830	CG	☑	☑	18-Nov-19	ok
8	CE5913F	CE	☑	☑	14-Nov-19	ok
9	CE166E20	CE	☑	☑	14-Nov-19	ok
10	CFCOBB6	CF	☑	☑	22-Oct-19	ok
11	CF248C	CF	☑	☑	17-Oct-19	ok
12	CE4771	CE	☑	☑	16-Oct-19	ok
13	CEB043	CE	☑	☑	16-Oct-19	ok
14	CE518AD	CE	☑	☑	25-Oct-19	ok
15	CGSZYY20181220	CG	☑	☑	5-Nov-19	ok
16	CG1099F	CG	☑	☑	5-Nov-19	ok
17	CF10395	CF	☑	☑	26-Nov-19	ok
18	CFE45EE	CF	☑	☑	31-Nov-2019	ok