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CHAPTER 2

The Cambodia Labor Market and Skills Gap

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Abstract

The influx of non-skilled and low-skilled workers from agriculture to non-agriculture sectors, industry and service in particular, yields constrain to employers through its form of skills gap, which has a potential influence on country's economy. With an estimated 300,000 new entrants to the labor market every year, youth aged 15-29 years old make up about 43 percent of the total working age population, but only 31 percent of youth have matching qualifications for their occupations. It shows a significant weakness in Cambodian education system though the country is rated as the lowest average age among the ASEAN nations.

This study aims to identify the current skills gap in the Cambodian workforce and identify policy solutions that will support the preparation of the Cambodian workforce in its transition toward industrialization.

To achieve the objective above, qualitative methodology is employed to review four Employer Skills Needs Surveys in order to understand the trend of employment in Cambodian labor market. Reflecting this reality, key informants' interview is also conducted with some relevant stakeholders to seek their perceptions on the trend of skills gap and skill requirement alongside the policy solution.

The study has found that information gap exists to be the most constrains pushing Cambodian students out of TVET program and study subjects which are irrelevant to the market skill requirement. TVET has been risen as the best program to respond the skill needs but constrain is remain in term of student enrolment and the quality. The industrial 4.0 only give opportunity to those who are able to catch up with technology, but it puts pressure on low skilled workers risking job lose. Transforming a labor intensive to skilled intensive has to be prioritized which the Royal Government of Cambodia should establish TVET and Career Council Center in highs school in order to improve the Labor Market Information and to design TVET program in a more effective way through Public-Private Partnership and apprenticeship.

Key words: Skills gap, employment and labor market, skilled and high-skilled workers, TVET, Industry 4.0, Public-Private Partnership, and Apprenticeship.

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Introduction

A skills gap is broadly defined as “*a deficiency in the skills of existing employees*” (Holt, Sawicki, & Sloan, 2010) . In the development context they are most commonly exacerbated during stages of economic growth and transition. Economic growth is often accompanied by structural change, resulting in a reduction in the agricultural sector’s share in the economy (Sparreboom & Staneva, 2014) and an increase in rural-urban migration as citizen’s migrate towards urban centers in search of improved employment opportunities (Masson, 2001). A study by OECD shows that Cambodia’s economy is in the transition, but needs to diversify further (OECD, 2017). Cambodia’s citizenry has the lowest average age in the ASEAN [QUOTE], the country’s economy is leaned on them. Cambodia’s citizenry has the lowest average age of 34.6 years old with the shares of young people between 15 and 24 years of age of 29 percent in the ASEAN (Chang & Huynh, 2016). This statistic provides advantage to Cambodia when it comes to the driven labor force of the nation where the country’s economy will rely on them.

This privilege constrains the country further since it stays behind other ASEAN cohorts in terms of education where majority of Cambodia’s workers; close to 90 per cent; only graduate from primary education or less (Chang & Huynh, 2016). In addition to this, within the population ages 20-24, many of them are already in the labor market but have very low levels of education (ADB/ILO, 2015). Some rural workers have moved out of the agricultural sector into the non-agricultural sector; industrial and service (Kang & Dannet, 2013), and mostly low-valued jobs are being added with the two-thirds of new jobs are in hospitality and other services (Cambodia K. o., 2019). In spite of the perceived ‘low-value’ sectorial shift, Cambodian workers are still identified to lack the requisite skills at this stage as they make the transition. For instance, productivity is low at all stages of garment manufacturing and this has been attributable to inefficient use of machinery (Hossain, 2010). Whilst output in garments has grown steadily, the skills gap renders a gap at the possibility of output. Between 2011 and 2014, employment

grew as average economic growth grew at a rate of 7.4% per year (Kuoich, 2015, p. 54). However, the sector transformation in Cambodia from agriculture to industry, shows a significant effect on the flow of labor.

Notably, the employment in agriculture declined from 58.3 percent to 36.4 percent between 2004 to 2016 with the increase of employment in the industry and service sectors (Bank, 2018, p. 36). To some extent, school drop-out rate in upper secondary school was also increased from 10% to 24% at the same time. It witnesses the demand of industrials and footwear for low skills labor which demand for low skill was decreased in agriculture, while in industrial was increased to 42% in 2014 among those school drop-out group (Centre, 2017, p. 59). Not surprisingly, the traditional or non-formal economy is often associated with lower levels of education and skills (Sparreboom & Staneva, 2014). Though Cambodia achieved the status of lower middle-income country by 2015 with more than two decades of sustained rapid economic growth (Bank, 2018, p. 35), skills gap remains the issue to the Kingdom. Addressing the skills gap will be a means of helping Cambodian youth to have a decent work and have higher income in line with the Cambodian government's plan; pushing Cambodia to become the upper middle income country by 2030 and higher income country by 2050 (Bank, 2018). It requires Cambodia to upgrade its labor force or skills from low to high skill which takes years to reach (Cheng I.-H. b., 2015).

To identify the current skills gap in the Cambodian workforce and policy solutions that will support the preparation of the Cambodian workforce in its transition towards industrialization, this research aims to answer the question: **how can Cambodia education be designed in order to facilitate skills for the diversification of Cambodia industry?** Three sub research questions are used in order to answer the research problem which are (1) what factors determine skills gap? (2) what are the skill requirements in the Cambodian labor market? and (3) what will be the needs placed on the education and training system in response to the rise of manufacturing industry and industrialization?

Cambodia has developed rapidly with an average of sustained economic growth of 7.6 percent during 1994-2015. This pushed the Kingdom achieved the status of lower middle-income country by 2015 (Bank, 2018). The growth remains high at 7.5 percent in 2018 compare to only 7 percent in 2017 (Bank, 2019). However, the economic growth is often accompanied by structural change, resulting in a reduction in the agricultural sector's share in the economy (Sparreboom & Staneva, 2014) and an increase in rural-urban migration as citizen's migrate towards urban centers in search of improved employment opportunities (Masson, 2001). It masks as an underlying issue of under-skilled workers as OECD (2017) shows, Cambodia's economy is in the transition from agriculture to industry and service sector, but needs to diversify further (OECD, 2017). It significantly effects the flow of labor since some rural workers have moved out from agriculture into the non-agriculture sector, industry and service sector (Kang & Dannel, 2013). Notably, the employment in agriculture declined from 58.3 percent to 36.4 percent between 2004 to 2016 with the increase of employment in the industry and service sectors (Bank, 2018, p. 36). To some extent, school drop-out rate in upper secondary school was also increased from 10% to 24% at the same time. It witnesses the demand of industrials and footwear for low skills labor which demand for low skill was decreased in agriculture, while in industrial was increased to 42% in 2014 among those school drop-out group (Centre, 2017, p. 59).

Though Cambodia's citizenry has the lowest average of 34.6 years old in the Association of Southeast Asian Nations (ASEAN), the shares of young people between 15 and 24 years of age is 29 percent (Chang & Huynh, 2016), this provides a skeptical disadvantages to Cambodia. Within the population ages 20-24, many of them are already in the labor market but have very low levels of education (ADB/ILO, 2015). This constrains the country further as Cambodia education is far behind other ASEAN cohorts, and the majority of its workers; close to 90 per cent; only graduate from primary education or less (Chang & Huynh, 2016). Not surprisingly, the traditional or non-formal economy is often associated with lower levels of education and skills (Sparreboom & Staneva, 2014). Significantly, mostly

low-valued jobs are being added with the two-thirds of new jobs are in hospitality and other services in Cambodia (Cambodia K. o., 2019). In spite of the perceived 'low-value' sectoral shift, Cambodian workers are still identified to lack the requisite skills at this stage as they make the transition (Bruni, Luch, & Kuoch, 2013). For instance, productivity is low at all stages of garment manufacturing and this has been attributable to inefficient use of machinery (Hossain, 2010). Whilst output in garments has grown steadily, the skills gap renders a gap at the possibility of output. As employers broadly define a skills gap as "*a deficiency in the skills of existing employees*" (Holt, Sawicki, & Sloan, 2010), they are commonly exacerbated during the stage of economic growth and transition in the development context (OECD, 2017). For, to identify the current skills gap in the Cambodian workforce and policy solutions that will support the preparation of the Cambodian workforce in its transition towards industrialization, this research aims to answer the question: **how can Cambodia education be designed in order to facilitate skills for the diversification of Cambodia industry?** Three sub research questions are used in order to answer the research problem which are (1) what factors determine skills gap? (2) what are the skill requirements in the Cambodian labor market? and (3) what will be the needs placed on the education and training system in response to the rise of manufacturing industry and industrialization?

Section 2 explores the literature on skills gap in Cambodian context and how skills gaps are measured. Section 3 discusses the research methodology which briefly describes how the key stakeholders are identified for the interview to reflect the literature of employer's skills needs surveys under the NEA. Section 4 employs the result and analytical of the study by exposing to the situation of Cambodia labor market and the prospect of skill industry. To conclude, section 5 employs the discussion over the means of transforming Cambodia from a labor intensive to a skilled intensive economy and the response toward the manufacturing industry with the policy options.

Literature Review

Conceptualization of a Skills Gap

Skills matching problems are categorized in multiple ways in different forms such as skills shortage, skills obsolescence, or skills gap. This literature basically focuses on the problem of skills gap and how it negatively affects the employee performance and employer production. Prior to expose to skills gap, it is important to identify and understand key terms had been mentioned above.

Skill refers to the “ability to perform certain specified tasks” (Holt, Sawicki, & Sloan, 2010, p. 10) or the capacities to act in accordance with the required performance (Heckman & Mosso, 2014, p. 6). Denise Jackson (2009) refers skill to the competencies which have been categorized into (a) the task requirements of graduate position, akin with a job description, and (b) personal characteristics deemed important by employers.

In addition, skill is commonly discussed in the job market, particularly from the supply side and demand side with the current state of related skills issues; skills mismatch, skills shortage, skills obsolescence, and especially skills gap.

Cappelli defines skills mismatch as any given time the supply of skills and the demand for skills could be out of synch in either direction: over-supply or under-supply (Cappelli, 2015). The problem is that there are information asymmetries between the education and skilling (McGuinness, Pouliakas, & Redmond, 2017). Since the concepts of skill mismatch are measured subjectively, the surplus human capital is typically measured in terms of over-education or over-skilling (McGuinness, Pouliakas, & Redmond, 2017). Further, the literature has focused almost exclusively on the impacts of over-education and over-skilling at the individual level, and has largely ignored the impact of skill gaps at the firm level (McGuinness & Ortiz, 2016). While a skill shortage is obviously a particular type of skill mismatch, a skills gap could be a general form of mismatch, too which all these complaints collectively referred to as skill problems (Cappelli, 2015). Skill shortages

is defined as a short on job-related skills of the kind associated with particular occupations (Cappelli, 2015). It is related to a situation whereby employers are unable to fill key vacant posts due to a lack of suitably qualified candidates (McGuinness, Pouliakas, & Redmond, 2017). Similarly, skill obsolescence is viewed as a productivity challenge to employers. It is referred to the process by which workers' skills become obsolete (McGuinness, Pouliakas, & Redmond, 2017). Skills can become obsolete due to ageing which depreciates certain manual skills (physical obsolescence), through technological or economic change which renders certain skills unnecessary (economic obsolescence) or through the underutilization of skills (skills atrophy) (Allen & Grip, 2007). Resulting from this, older workers may face a decreasing productivity due to rapid changes in the world of work, particularly the increasingly complex technology that is being used in many industries (Allen & Grip, 2007)."

Less-developed nations are characterized by lower levels of educational attainment as well as poor quality of education and limited skills accumulation, with the lack of adequate schooling being one of the reasons for the problems of under-qualification, skills shortages and skills gaps (Sparreboom & Staneva, 2014).

Skills gap

When asking ourselves whom to ask, or where to look at, in order to access skill gaps, it seems more advisable to look at employers' perception, at least if we are concerned with firm-level performance (Allen & Grip, 2007).

When it comes to the measurement of skills gap, Allen and Grip (2007) suggest looking at employers' perception.

Employees' perception of skill gaps cannot explain firm-level performance. The employers' perception could be explained either because employees overestimate their competency levels, because they fail to recognize instances where their skill gaps are important for productivity or because employee responses actually capture future career aspirations, more than current job requirement (Allen & Grip, 2007). To define a **skills gap**, Weaver and Osterman start with the observation that

the market for skills has both a supply side and a demand side which a skill gap implies that the quantity demanded for a particular skill exceeds the quantity supplied (Weaver & Osterman, 2017). Holt, Sawicki and Sloan define "*skills gap relates to a deficiency in the skills of existing employees*" (Holt, Sawicki, & Sloan, 2010, p. 10). Since skills gaps is a systematic shortfall exist in skills, it is broadly defined as the decline associated with the poor skills of school leavers, and the explanation for that shortfall is usually that schools have failed, so academic performance of students has declined (Cappelli, 2015). Further, Monika Aring defines that the gaps in skills are caused by two converging factors: (i) a qualitative skills mismatch where companies do not find graduates employable even when they have the right qualifications on paper, and (ii) a quantitative mismatch where not enough young people are educated and trained at certain level or they out-migrate to countries where they can earn higher wage (Aring, 2012, p. 5). However, the connection of skills gaps with the skill mobility which is the matter of the information gap, too. It doesn't take place between the employers and school, opportunity and information is arguable to the link (Bodewig, Badiani-Magnusson, Macdonald, Newhouse, & Rutkowski, 2014).

Generally, skill gaps are usually measured by collecting information from the employer on the perceived skill deficiencies of workers. When similar questions are directed at workers within firms, this is usually akin to under-skilling, although the form of the question is likely to differ (McGuinness, Pouliakas, & Redmond, 2017). It has been argued in the literature that skill gaps and under-skilling are the same thing and they are likely to be highly correlated; however, as with all forms of mismatch, it is unlikely that the correlation will be strong (McGuinness & Ortiz, 2016). However, according to the correlation of employer-reported skills gap and employee perceptions of under-skilling within Irish enterprises, the finding shows that it is more common for employees to report skill gaps in firms than employers (Allen & Grip, 2007).

Skill gaps may have the potential to harm firm-level productivity which tend to inflate average labor costs (McGuinness, Pouliakas, & Redmond, 2017). For,

organization requires more workers per unit of output due to lower output per worker (McGuinness & Ortiz, 2016). At the same time, skills gap can only be eradicated through firm-sponsored training or by providing individuals with relevant incentives to participate in upskilling (ECDEFOP, 2010). According to Keith Marshall, skills gap can be filled by further training of the existing workforce (MBS, 2004). A more developed HRM structure is a top-down way of gathering information about skill gaps, and eventually correcting them (McGuinness & Ortiz, 2016). Weaver and Osterman found that skill gaps are not 'the mechanical result of under-trained workers who simply cannot meet the skill demands of modern industry', but such highly specialized skills may be a problem if a plant is unwilling or unable to conduct internal training and if local training providers also refuse to do so (perhaps because of limited economies of scale) (Weaver & Osterman, 2017). Since the employer believes that workers do not possess the adequate competencies to successfully discharge their current role (McGuinness, Pouliakas, & Redmond, 2017), skills gap is measured the extent to which workers lack the skills necessary to perform their current job (McGuinness, Pouliakas, & Redmond, 2017). It can be described the phenomenon whereby the skill levels of workers are insufficient to meet the requirements of their current job (McGuinness & Ortiz, 2016).

Employee empowerment had increased, workplaces had moved toward high-performance work systems that required greater skills, and employers trained constantly and saw human resources as investments rather than costs (Cappelli, 2015). Thus, the way to improve student skills and to increase employability was to bring schools and employers closer together in an effort to smooth the transition from school into work (Cappelli, 2015). In practice it meant apprenticeships, coop programs, internships, and other arrangements that would help students see the practical value of classroom lessons, first, by using more business and workplace examples in the classroom and, second, by seeing how those examples could be applied at work. The failure of the education system to provide students with basic skills/ basic skills of future employees is viewed as the cause of a skills gap (Cappelli,

2015). Whenever young people have not completed education to that stage (basic literacy and numeracy skills are the foundation to any technical skills required in the world of work, and are best acquired through education up to lower-secondary level), a gap of “foundation skills” is likely to exist (UNESCO, 2012). Therefore, it is important that policy continues to focus on tackling the issue of skill shortages and skill gap; however, a greater balance needs to be struck between policies aimed at improving welfare by eliminating gaps in the productive capacity of human capital and those that achieve the same goal by removing constraints that restrict the productive capacity of human capital (McGuinness, Pouliakas, & Redmond, 2017).

Skills Gaps in The Cambodia Context

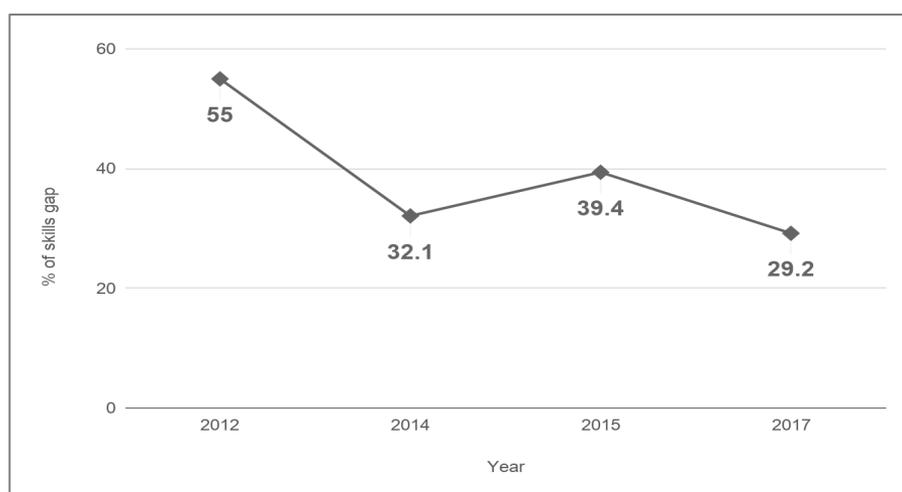
The World Bank has identified two categories of skills as crucial to meet workforce demands in Cambodia: technical skills and life skills (Cheng I.-H. b., 2015, p. 136). Technical skills refer to technical abilities specific to a task or activity in the booming sectors; garment, tourism and construction are examples (also known as hard skills); while life skills are competencies and personal attributes that enable people to cope effectively with everyday life which are composed of thinking skills and behavioral skills (also known as soft skills) (Cheng I.-H. b., 2015, p. 136).

However, when discussing the skills gap in Cambodia, National Employment Agency (NEA) is the primary institution to consult. It gives insightful of employer’s perspective through its employer skills needs surveys. So far, NEA has been conducted four Employer Skills Needs Surveys, 2012, 2014, 2015, and 2017. Each survey consisted of more than 500 establishment interviews from investigated sectors that drive engines for employment generation and having greater share in Cambodia’s GDP. These sectors are Food and Beverages; Garment, Apparel and Footwear; Rubber and Plastics; Construction; Finance and Insurance; Accommodation; Transportation, Warehouse and Logistics; Human Health; Education; and Information and Communication Technology (ICT).

The first survey (2013) was the significant report to provide labor overview of employment sector in Cambodia. With a positive notice, the situation has been

increasingly better from year to years and the skills gap issue is also significantly decreased. According to the first survey (Bruni, Luch, & Kuoch, 2013), 55 per cent of employers reported that employees did not perform at the required level which caused by the lack of motivation, workers were new to their role, inexperience, insufficient training which limited impact on workers' performance alongside the problem of ongoing innovation processes that constrained their business operations. However, only about a third (32.1%) of the establishments in 2014 survey declared that their employees did not perform the jobs at the required level (Kuoch, 2015). Similarly to the previous survey, employees could not perform well in regard to the causes of lack of motivation, new to the role, first time jobseeker or have recently been promoted to a higher position and not receiving the appropriate training or training providing to be ineffective and staff training being only partially completed (Kuoch, 2015). In the 2015 survey, 39.4 per cent of the establishments declared to encounter the issue of skills gap which was slightly increased, but caused a similar characteristic (NEA, 2016). Positively, only 29.2 per cent of establishments in 2017 survey declared to have encountered the issue of skills gap alongside the reasons of new to the role, training is currently only partially completed and the problem of retaining staff (NEA, 2018).

Figure 1 Trend of skills gap from employer surveys (2012, 2014, 2015 and 2017)



Source NEA Employer's skills needs surveys (2012, 2014, 2015, and 2017)

Skills gap tended to be most concentrated among plant and machine operators, with 4.6 % of the total employees in this occupation were perceived to be not fully proficient. Moreover, the unskilled and skilled workers (both manual and non-manual) were seem as more likely to have skills gaps than the highly skilled occupations that might require higher qualifications (Kuoch, 2015). In addition, the analysis by broad occupation groups and sector also shows that the high skilled workers played major roles in health, education, finance and insurance, and ICT (NEA, 2016).

Apart from skills gap issue, surveys also provide the flow of skills shortage and indicate some dramatically changes in Cambodian workforce. It evidences that technical or practical skills was highly in short supply of skills in 2012 and 2014 while the foreign language skills became the highest shortage in 2015 and 2017. Not only that, job-specific skills, foreign language skills, oral communication skills, and basic computer literacy/ using IT are also reported as the shortage of skills in 2012 (Bruni, Luch, & Kuoch, 2013) following by foreign language skills, basic computer literacy/using IT, customer management skills, and problem solving skills in 2014 (Kuoch, 2015).

In 2015, however, foreign language skills become more important since it is in the highest short supply in the market followed by the oral communication, technical or practical skills, customer handling skills, and problem solving skills (NEA, 2016). Similarly, foreign language remains important in 2017 alongside technical or practical skills, customer handling skills, oral communication skills, and teamwork skills (NEA, 2018).

Table 1 Skills shortages

Year	1	2	3	4	5
2012	Technical or practical skills	Job-specific skills	Foreign language skills	Oral communication skills	Basic computer literacy/using IT

2014	Technical or practical skills	Foreign language skills	Basic computer literacy/using IT	Customer management skills	Problem solving skills
2015	Foreign language skills	Oral communication	Technical or practical skills	Customer handling skills	Problem solving skills
2017	Foreign language skills	Technical or practical skills	Customer handling skills	Oral communication skills	Team work skills

Sources NEA Employer's skills needs surveys (2012, 2014, 2015, and 2017)

(Note: From 1 is the most shortage, 5 is the less shortage)

Methodology

Three common indicators to examine the issue in the context of skill gaps are (i) an indicator of a gap perceived both by employers and employees; (ii) an indicator of a gap based on the employer measure perceptions only; and (iii) an indicator of a gap based on employee perceptions only (McGuinness & Ortiz, 2016). Most studies have done on skills gap by focusing on the firm level, particularly the employer's surveys. For instance, four employer's skills need surveys, 2012, 2014, 2015, and 2017, were established under the National Employment Agency (NEA) serving as the main sources of information on the country's labor market prior employees entering the workforce (Bruni, Luch, & Kuoch, 2013) (Kuoch, 2015) (NEA, 2016) (NEA, 2018).

This study aims to give an overview of the causes leading skills gap to exist in the Cambodia labor market, critically the areas of workforce, education and training. To achieve this, qualitative methodology is employed in in-depth interviews with key informants from different backgrounds for the primary data – Ministry of Labor and Vocational Training – National Employment Agency (NEA) and Directorate General of TVET (DGTVET), INGOs – UNESCO, ILO, ADB, as well as a youth community platform – Sourmouy (literately means: Ask One). Through the

interview, it aims to identify the main barriers or challenges that are preventing skills or qualification to students and workers. It purposely seeks the perception of stakeholders about current state of problem along the policy that will support the preparation of the Cambodian workforce in its transition towards industrialization.

Further, the study will also review employer skills needs surveys, mentioned above, from the National Employment Agency and existing literatures as the secondary data. Since this paper focuses more on flow of labor into the diverse industries, it aims to question the education sector in supplying knowledge and skills to workers prior to enter the industry, particularly the light manufacturing.

Stakeholders

Directorate General of TVET (DGTVET), National Employment Agency (NEA), Asian Development Bank (ADB), The United Nations Educational, Scientific and Cultural Organization (UNESCO), International Labor Organization (ILO), and Sourmouy are key stakeholders in the study. For the empirical requirement, they are selected for interview because these organizations work directly and indirectly on current Cambodian labor force. By talking to them through interviews, it helps the researcher to get the rich resource of information on current state of research issue.

Table 2 Stakeholder Overview

Name of Key Informant Institution	Area of work
Directorate General of Technical Vocational Education and Training (DGTVET)	DGTVET is the state institution acts as the secretariat for the National Training Board (NTB) responsible for supporting, expanding and assuring the quality of public and private provision of TVET.
National Employment Agency (NEA)	NEA is the Cambodian public one-stop service provider of employment and labor market which links job seekers with employment opportunities.
Asian Development Bank (ADB)	ADB is the regional development bank that provides loans, technical assistance and grants to Cambodian government to promote human development in the Kingdom.

United Nations Educational, Scientific and Cultural Organization (UNESCO)	UNESCO is the United Nations branch working in education sector to assist the Royal Government of Cambodia improves the rate of children to education and decrease the rate of student drop-out.
International Labour Organization (ILO)	The ILO is the United Nations office that work in diverse areas of labor force in Cambodia including employment, governance and occupational standards.
Sourmouy (Literally means: Ask One)	A youth community platform to provide Cambodian youth a mentorship support on study and career guidance.

Under the Ministry of Labor, Vocational and Training (MoLVT), Directorate General of TVET (DGTVET) and National Employment Agency (NEA) are the main states institutions to provide employment and labor market information and skills training of basic skills to prepare for a job. DGTVET functions in the role of supporting, expanding and assuring the quality of public and private provision of TVET (UNEVOC, 2014) while NEA functions as the employment and labor market information one-stop service provider, linking job seekers with employment opportunities, and employment information research institution. They are identified to be resourceful institutes to provide rich information of labor market under the ministry.

Beside the states institutions, Asian Development Bank (ADB) is the main financial and technical support to the Royal Government of Cambodia not only addressing the skills gap, but to provide skills to marginalized groups, especially through its technical and vocational education and training (TVET) projects. Through a co-working directly with the MoLVT, many projects have been delivered and are currently delivering including Skills for Competitiveness Project (ADB, 2019), Strengthening Capacity Development for National Skills Development (ADB, 2018), Technical and Vocational Education and Training Sector Development Program (ADB, 2014), Toward Adopting a Skills Development Fund for Cambodia (ADB, 2018) and Policy Priorities for a More Responsive Technical and Vocational Education and Training System in Cambodia (ADB, 2016).

The United Nations Educational, Scientific and Cultural Organization (UNESCO) plays an essential role supporting RGC improves the rate of children to education,

particularly basic education to marginalized children and youth. It significantly contributes to the role of education to Cambodia labor market. It recently initiated a program, namely Basic Education Equivalency Program (BEEP) (2019) as a bridging learning program for out-of-school youth to complete lower secondary/basic education, equivalent to grade 9. BEEP is a joint initiative of MoEYS and MoLVT with UNESCO support to provide flexible alternative education through an online platform while they are working.

The International Labor Organization (ILO) has been an active partner in Cambodia's economic, social and democratic recovery since the early 1990s (ILO, 2019). In terms of labor force, it significantly works in diverse areas such as employment, governance and standards. The International Standard Classification of Occupations (ILO, 2012) and the first employer's skills need survey (Bruni, Luch, & Kuoch, 2013) are examples.

Finally, Sourmouy (literally means: Ask One) is an online mentoring platform for students to choose the right majors/ subjects for tertiary education, career scholarship, entrepreneurship, and technical and vocational education and training (TVET) (2019). Since Sourmouy is a youth community platform, it allows a researcher to expose further perspective on how youth representative views on the trend of Cambodian labor market.

Question Design

To answer the main research questions, three sub-research questions need to be answered.

1. What factors determine skills gap?
2. What are the skill requirements in the Cambodian labor market?
3. What will be the needs placed on the education and training system in response to the rise of manufacturing industry and industrialization?

This section discusses how the key informant interview questions are designed and why they are important in order to answer each sub research questions. There are

three main subdivisions of the interview questions; (i) the situation on Cambodian labor market – skills shortage, factors determine skills gap and challenges; (ii) prospect on skill industry – Industry 4.0 and skill outlook; and (iii) the response to skills industry – Cambodian government 2030 agenda and the policy response.

The first sub research question of *“what factors determine skills gap?”* is directly asked under the first subdivision. Prior to asking this question, some questions are needed to be answer in order understand the situation of current Cambodian labor force and challenges that constrain workers from performing well at the workplace and before they get into the workforce. These questions are:

- what skills do you believe are in short supply in the Cambodian labor market?
- What are the main challenges for the Cambodian workforce prior to enter the job market?
- How well prepared or competent are recent graduates for entering the job market?

The second sub research question of *“What are the skill requirements in the Cambodian labor market?”* is answered through asking the question of “what skills will employer look for?” alongside the second subdivision’s questions including “How does industrialization 4.0 impact the skills requirements of a growing Cambodian economy?” and “In a 10-years prediction on Cambodian labor force, what skill demand do you see in Cambodia skill industry?” By asking these questions, they provide information related to the trend of technology and how it affects skills industry in Cambodia.

Based on the change in skill industry, questions in the subdivision (iii) response to answer the sub research question number 3 of “What will be the needs placed on the education and training system in response to the rise of manufacturing industry and industrialization?” The employed questions are “Transforming Cambodia from the labor intensive to skill intensive is the RGC’s prioritized agenda.

What are the key steps that need taken to ensure that this priority is met?” and “What should be improved to respond the trend of this manufacturing industry?”

Finally, two additional questions were asked prompting to understand the roles and challenges of stakeholders in promoting and delivering education and skills training. “What are your organization’s roles, government or non-government institution, in promoting/providing skills to students and workers?” was employed to expose to employment and training situation while “what are the main barriers your institution challenges in providing skills to them (students and employees)?” was asked to explore further obstacles they have faced. This answer is important since it doesn’t only give information on roles and constraints, but it provides a policy sense to shape and adjust with according to those challenges.

The next section will be discussing the results of the key informant interviews align with other literatures to help answering the research question. With the thematic break down, the result will discuss based on the three main themes that had mentioned above, the situation on Cambodian labor market, prospect on skill industry, and the response to skills industry.

Section 4 provides a collective conceptualization of stakeholder thoughts and NEA observations. These concepts are broken down thematically and discussed in greater detail, prior to informing a concluding discussion and policy insight.

Results and Analysis

Situation on Cambodian Labor Market

Youth in the Job Market

The connection between employer and employees remains a challenge in Cambodian labor market. It significantly constrains Cambodian youth from accessing the job market because there is a limitation of employers’ engagement and the lack of on-the-job training. According to R. Ou (*personal communication*,

September 25, 2019), workers need training and practical work prior to work in the new field when there is a structural change in the economy, so the productivity will also increase, particularly from agriculture into the industrial sector. With an estimated of 300,000 new entrants to the labor market every year, youth aged 15-29 years old make up about 43 per cent of the total working age population, but only 31 per cent of youth have matching qualifications for their occupations (UNDAF, 2018). It significantly proves that Cambodian youth has limited capacity, specifically in education. It constrains them from preparing for skill requirements in job market as majority of them are still in low skill labor force (*K. Leav, personal communication, October 2, 2019*). To university students, lacking knowledge and ability to seek opportunities make them less competitive (*R. Ou, personal communication, September 25, 2019*). Chhom and Madhur (2015) argue that Cambodia's education system does not provide youth with appropriate employability skills (Chhom & Madhur, 2015). Though the 2017 employer skills need survey shows good level of work preparedness of university graduates which is better than any other graduates (NEA, 2018), TVET graduates are more readiness than them as TVET graduates are well trained and more practical (*TVET Expert, personal communication, October 7, 2019*). University students seem not to be ready because of input factor that they don't have basic knowledge, in terms of mismatch between what they are good at and what they study. Further, school environment is another problem prohibits them to be ready. The tradition of theory base in study Curriculum and teacher's teaching still exists alongside the lack of principal over students' behavior and study. Students need real-work-place experience up to 6 months prior to work²⁰ which doing volunteering or internship should be in a policy when they are in year 3 or 4 (*R. Ou, personal communication, September 25, 2019*).

20 (R. Ou, personal communication, September 25, 2019) and (TVET Expert, personal communication, October 7, 2019)

Skills Shortage

National Employment Agency (NEA) is the key state institution keeping eyes on the trend of employment market in the Kingdom by conducting the employer skills needs survey; 2012, 2014, 2015 and 2017. Five factors are determined to be shortage in Cambodian labor market which are Foreign language skills – English, Chinese, Technical or practical skills – skills that worker need to work in that field, Customer handling or service – the emerging middle class and purchasing power which change people’s behavior, Soft-skills – oral communication, team work and problem solving skills, and Computer literacy skills – word, excel in the office, not through internet or social media (*S. Kouch, personal communication, October 8, 2019*). Because soft-skills and ICT skills are in the shortage²¹, they add value above the specific or technical skills employees have. These skills don't only lack with high school students, but freshman and Sophomore experience the same problem. It leads them to lose confidence and have less competition as they don't catch up with technology and things have happened in the society (*R. OU, personal communication, September 25, 2019*). Soft-skills predominantly lacks in tourism industry (*K. Leav, personal communication, October 2, 2019*). Following the Cambodia Job Outlook 2018, good professional job opportunities are expected to be in the area of computer, information technology and multimedia (NEA, 2018). On the other hand, skill level 3 and 4 (Table 3 – The International Standard Classification of Occupations (ILO, 2012)) are generally in short supply in Cambodian labor force. It especially takes place in manufacturing sector including mechanics, electrician, welding, and laboratory. Some skills that require technology and laboratory need research and development in order to increase the production output. Moreover, high position or management skills are normally dominated by foreigners which requires policy on this matter, so employer can save cost by employing to local profession (*R. Khleang, personal communication, October 10, 2019*).

21 (R. Ou, personal communication, September 25, 2019) and (K. Leav, personal communication, October 2, 2019)

In responding to current skills shortage, the Asian Development Bank (ADB) design project, namely Skills for Competitiveness Project 2020-2025 (ADB, 2019) to prioritize four sectors – construction, manufacturing, electricity, and electronics which are the main sectors contribute to Cambodia economic. This project serves the purpose of creating more skill workers within each sector by focusing on upper secondary school graduates and upskilling existing workers who lack technical skills (*TVET Expert, personal communication, October 7, 2019*). Further, under the Japan International Cooperation Agency (JICA), the Project for Improving TVET Quality to Meet the Needs of Industries is initiated to help TVET Institutes in Cambodia to produce high quality technicians for the industries in the near future by developing a standardized national TVET curriculum for higher diploma level in electricity that reflects the needs of the industries and strengthen system of student employment to connect TVET institutions and industries, with collaborating with the Directorate General of Technical Vocational Education and Training (DGTNET) and other authorities concerned (Consulting, 2016).

Though there are most common skills shortage in low and manual skill level, skills requirement can be changed based on level of occupation or position. For example, in the management position, strategic and leadership skill are needed (*S. Kouch, personal communication, October 8, 2019*).

Table 3 Four ISCO skill levels

Skill Level 1	Occupations typically involve the performance of simple and routine physical or manual tasks with completion of primary education or the first stage of basic education or short training. Occupations classified at Skill Level 1 include as office cleaners, freight handlers, garden laborers and kitchen assistants.
Skill Level 2	Occupations typically involve the performance of tasks such as operating machinery and electronic equipment; driving vehicles; maintenance and repair of electrical and mechanical equipment; and manipulation, ordering and storage of information. It generally requires the completion of first stage of secondary education. Occupations classified at Skill Level 2 include bus drivers, secretaries, sewing machinists, dressmaker, shop sales assistants, police officers, motor vehicle mechanics, and building electricians.

Skill Level 3	Occupations typically involve the performance of complex technical and practical tasks that require an extensive body of factual, technical and procedural knowledge in a specialized field. It normally requires a high level of literacy and numeracy which obtained as the result of study at a higher educational institution for a period of 1 to 3 years. It can be shop managers, medical laboratory technicians, legal secretaries, commercial sales representative, commuter support technicians, and broadcasting and recording technicians.
Skill Level 4	Occupations typically involve the performance of tasks that require complex problem-solving, decision-making and creativity based on an extensive body of theoretical and factual knowledge in a specialized field. It requires extended level of literacy and numeracy at a very high level and excellent interpersonal communication skills which obtained as the result of study at a higher educational institution for a period of 3 to 6 years. It includes sales and marketing managers, civil engineers, secondary school teachers, medical practitioners, computer systems analysts.

Source ISCO. 08 (ILO, 2012)

Factors Determining the Skills Gap

The connection of skills gap with the skill mobility is the matter of the information gap.

The lack of information or information gap between employers (in terms of what they need) and employees (in terms of the training they should have) doesn't exist because of the lack of connection between the employers and school, opportunity and information is arguable to the link (Bodewig, Badiani-Magnusson, Macdonald, Newhouse, & Rutkowski, 2014). Cambodia has no difference where information is a potential factor causing skills gap and influence other factors²². It is seen as the information asymmetry and information shortage. Information asymmetry exists when the information of skill requirements is not resourceful to students. Because information normally centers in the urban areas, youth and workers who live in

²² (R. Ou, personal communication, September 25, 2019), (K. Leav, personal communication, October 2, 2019), (TVET Expert, personal communication, October 7, 2019), (S. Kouch, personal communication, October 8, 2019) and (R. Khleang, personal communication, October 10, 2019)

rural areas are constraint from accessing it (*S. Kouch, personal communication, October 8, 2019*). In addition, the unwillingness of following the trend of employment information lets Cambodian youth to end up by following their cohort to study irrelevant subjects which doesn't require in labor market (*R. OU, personal communication, September 25, 2019*). Further, the consequence of lacking this information literacy causes Cambodian youth to be affected in terms of communication, network, and even competition. As Campbell suggests, comprehensive labor market institutions that are either absent or inadequate not only leave workers unprotected, they also result in substantial “information asymmetries”, such as the ignorance of possible labor market opportunities where they might lie (Campbell, 2013).

The wrong perception of students and their parents to study at university in non-TVET doesn't answer to the market requirements (Bruni, Luch, & Kuoeh, 2013). It remains as the problem that constrains them from enrolling in TVET²³. The requirement of enrolling in formal TVET program is to graduate from lower secondary school or through a skill bridging program. To rural youth in particular, family and economic condition, especially the condition under micro-finance institution (IMF) force them to drop out from lower secondary school which they even loss opportunity to enroll in formal TVET program (*K. Leav, personal communication, October 2, 2019*). Apart from that, the limited broadly information and advertisement of TVET influences them not to value TVET, but university instead (*TVET Expert, personal communication, October 7, 2019*). For example, there is no career council service center to be available in every province, especially in the remote areas to provide youth the skill requirement information and TVET awareness in order to assist them to stay up to date with job market.

²³ (K. Leav, personal communication, October 2, 2019), (TVET Expert, personal communication, October 7, 2019) and (R. Khleang, personal communication, October 10, 2019)

Education system is another skeptical factor (*K. Leav, personal communication, October 2, 2019*). The subjects of job market required; STEM education; are yet to be strong where it is not out reachable to students and number of enrolments is still low, particularly through TVET. According to Lamia (2018), a well-designed formal TVET programs may be more effective than general or academic education for integrating marginalized group into the labor market and improving their earning (Lamia, 2018). Though NEA and TVET institutions are working to promote and equip TVET skills, those institutions haven't worked well, or their function is limited (*K. Leav, personal communication, October 2, 2019*). Quality of TVET institutions (training and outdated facilities) are main constraints to the rate of return on the TVET investment (*TVET Expert, personal communication, October 7, 2019*). NGO sector offers a variety of opportunities to upskill labor force, such as vocational schools, hospitalities training and some IT skills centers (B2B, 2019) while formal education's curriculum is not outstanding to meet this requirement (*R. OU, personal communication, September 25, 2019*). Poor quality of Cambodian education creates a labor surplus, and labor force is categorized by low education levels and skills (Kuoch, 2015). It proofs that strengthening quality education and training are essential for Cambodia's rural youth (Abel, 2018). Other factors partially influence as such civil war, workplace attitude, enterprise, flow of information and enterprises themselves (*S. Kouch, personal communication, October 8, 2019*). Cambodia has been experiencing a demographic transition during the Khmer Rouge Regime resulting the group of experienced low number of middle-aged workers and the baby-boom generation (Kuoch, 2015). It put pressure on Cambodian education leading the labor force in shortage and weak because of the short supply of educated youth. Consequently, the transformation of agriculture to industry sector changes the workplace attitude where workers; those who used to work in agriculture; cannot adopt themselves with new working environment. When the human resource and strategies of employer is weak, it allows the gap in skills exist, especially when it does not invest in employee training when a small gap (*S. Kouch, personal communication, October 8, 2019*). "Though employees have

hard or technical skills, the skills gap takes place in terms of soft and digital skills" (S. Thorng, personal communication, November 4, 2019).

Prospect of Skill Industry

Industry 4.0

Industry 4.0 is just a wave of globalization or trend of digitalization and technology²⁴. *"Technology always affects us which needs adaptation to mitigate the risk" (S. Kouch, personal communication, October 8, 2019).* Cambodia is so far behind which needs policy to collaborate technology and people to work together, but not to replace the existing workforce (R. Ou, personal communication, September 25, 2019). According to an ILO study (2017) of the implications of the 4th Industrial Revolution for decent work in Cambodia, it estimates that over the next two decades, 57 percent of the Cambodian workforce (over 4 million workers) face a high likelihood of automation affecting their jobs. Technological advances are likely to significantly affect specific groups within the workforce, including low-skilled workers, women, youth and less educated workers. Sectors likely to be particularly affected are construction workers (87 percent), retail workers (81 percent) and the garment workers (88 percent) (ILO, 2017). Since everything will be automatic, more or less, Cambodia cannot escape from it (K. Leav, personal communication, October 2, 2019) and market competition will follow (R. Khleang, personal communication, October 10, 2019). It will affect the whole economy in two directions. First, it creates business opportunities and benefit those who have skills that can catch with technology. However, it brings concerns to those who don't have skills even though it is yet to see the negative aspect²⁵. Cambodia hasn't had heavy industry that rely on technology like other developed countries, but It still relies on pure labor,

²⁴ (R. Ou, personal communication, September 25, 2019), (S. Kouch, personal communication, October 8, 2019) and (R. Khleang, personal communication, October 10, 2019)

²⁵ (TVET Expert, personal communication, October 7, 2019) and (S. Kouch, personal communication, October 8, 2019)

especially in the textile sector (*K. Leav, personal communication, October 2, 2019*). With no difference, the average skill levels below those deemed necessary for appropriate technologies used in less developed countries were associated with significantly lower country productivity. These skill levels were associated with the most basic skills, such as low-level literacy (Acemoglu & Zilibotti, 2001). In response to this, some garment factories are thinking about it keeping their business up to date with technology and competition. Some form of Industry 4.0 already exists in the Tourism sector as such using tablet for ordering menu in a restaurant. Industry 4.0 requires trainings to adopt the market competition but thinking of workers who lay off by this industry is also essential to help workers who cannot catch up with technology (*R. Khleang, personal communication, October 10, 2019*). With the positive view and the hope of leave frog (*K. Leav, personal communication, October 2, 2019*), Industry 4.0 is important because it uses a lot of robotic which increases skill workers and reduces the number of unskilled workers. Therefore, the government needs to push and to create more skill workers to respond to the enterprise of I4.0 (*TVET Expert, personal communication, October 7, 2019*). Research and development plays an essential role to adjust with Industry 4.0 as the automation will also risk to some workers based on the areas of industrial growth (*S. Kouch, personal communication, October 8, 2019*).

Skill industry outlook in 2030

When a sector is developed, skills need to be adopted along the tendency of technology (*R. Khleang, personal communication, October 10, 2019*). However, in a 10-year prediction, the service sector is easy to be affected by the global shock while community-based enterprise or Small Medium Enterprises (SMEs) will become a sustainable sector that should focus on. To transform a raw material into products, particularly agro-products, skill training through TVET and research and development are required while Soft and ICT skills remain important to employment seekers (*R. OU, personal communication, September 25, 2019*). Social enterprise can see as a hub to deliver soft skills to youth through character formation, reskilling and targeting, and ownership development (Cheng I.-H. b.,

2015). If Cambodia's economy continues to grow with skill worker preparedness, the number of investments will increase, and investors from countries like Japan and China that are operating their businesses in neighboring countries will turn to Cambodia. This happens with the reason of cheap labor force in the Kingdom, comparing to neighboring countries. Responding to this need, the MoEYS and the MoLVT have started improving Technical High School by divide them into 2 streams; science and TVET (table 4); in the purpose of creating more technical works to attract further investment. What they afraid of is the current labor force in terms of the shortage of skill workers, so both MoLVT and MoEYS need to cooperate and work together to improve and increase technical worker that study in technical sector (*TVET Expert, personal communication, October 7, 2019*). On the other hand, if Cambodia doesn't have a well prepared of skill workers, it will face the problem of production line and in dire more skilled workers from other countries (*S. Thorng, personal communication, November 4, 2019*), ASEAN in particular.

Table 4 The Cambodian Qualifications Framework

Levels	Technical and Vocational Education and Training	General Education	Higher Education
Governance	Ministry of Labour and Vocational Training	Ministry of Education, Youth and Sport	
8	Doctoral Degree of Technology/Business Education		Doctoral Degree
7	Master's Degree of Technology/Business Education		Master's Degree
6	Bachelor of Technology/Business Education		Bachelor's degree
5	Higher Diploma of Technology/Business Education		Associate Degree
4	Technical and Vocational Certificate 3	Upper Secondary (Grade 10-12)	
3	Technical and Vocational Certificate 2		

2	Technical and Vocational Certificate 1		
1	Vocational Certificate	Lower Secondary (Grade 7-9)	

Source (NTB, 2012)

Skills Employers Look For

Employers may look for different skills depends on sectors; however soft skill is the most important skill highlighted by all key informants²⁶. Employers need those who are responsible and accountable. Hard or technical skill²⁷ is essential, but it can be trained after soft skills (*TVET Expert, personal communication, October 7, 2019*). In particular sector, tourism needs soft skill the most because communication is important in hospitality while industry and construction sectors need technical skills or skills in STEM to diversify and adopt with technology. Further, STEM is needed to upgrade and diversify in the agriculture sector, too in order to transform or manufacture raw material into the finished goods/ products (*R. OU, personal communication, September 25, 2019*). Beside the soft skill; life skills, green skills, and digital skills are also important, highlighted in the United Nations Joint program for Youth Employment in Cambodia Phrase II 2020-2024 (*K. Leav, personal communication, October 2, 2019*).

Results Discussion

Based on the finding in literature and from insights garnered from key informant interviews, this section develops a discussion on the main findings of the paper.

²⁶ (R. Ou, personal communication, September 25, 2019), (K. Leav, personal communication, October 2, 2019), (TVET Expert, personal communication, October 7, 2019), (S. Kouch, personal communication, October 8, 2019) and (R. Khleang, personal communication, October 10, 2019)

²⁷ (TVET Expert, personal communication, October 7, 2019) and (R. Khleang, personal communication, October 10, 2019)

Cambodia is undergoing a structural transformation as its economy continues to grow. There is an emerging gap as a result of the skills requirements for structural transformation – this is partly the result of a substandard training and education system (unlinked to the emerging needs of a growing economy). We have also identified that the gap is a result of information shortage and asymmetry, wrong perception from students and parents, education and training, and the labor transformation from agriculture to industry following by the emergence of technology in the industry. At the individual level, students or workers lack the soft and technical skills required to perform their role. These external factors will be explored further through the discussion and policy options below.

Features Causing, and Needing Addressed to Resolve, the Skills Gap

Information Availability

Information is a powerful tool to determine students' future. When students are able to access the correct information for the employment and labor market it allows them to fully prepare for the job market.

The finding shows that the flow of information, normally information is resourceful only within the urban area, constrains students to access available information of employment and the job market. It provides evidences that information plays important roles not only in employment sector, but education and training is significantly linked. Since the gap in information prohibits them not to access labor information as well as the TVET program, they are totally loss the opportunity to prepared themselves for a right subject to study and for a better employment in the future. This skeptically requires a certain solution to provide information nationwide, so that it can help students, particularly those who stay in countryside and remote area to equally access any information of employment and training.

Education and Training

Poor education and training have resulted in a portion of the skills gap. Moving forward this needs to be addressed. Over the next stages of development, there is a growing need to ensure that training is adequate in order to deliver the potential for growth for the kingdom. Several factors have emerged as pressing TVET in Cambodia not to functioned well in response to the labor market requirement with the forms of low quality, not up-to-date facilities, low student enrollment, and less interest from students, and the limitation of private involvement, particularly through the form of apprenticeship. To Cambodia, the wage worker faces to lose job within 88 percent of garment industry (Chang & Huynh, 2016) which only concerns the kingdom. Link to the human capital as a key determinant of both competitiveness of the labor force and the inclusiveness of economic growth, a United Nations Development Program study, namely Human Capital Dynamics and Industrial Transition in Cambodia (Thangavelu, 2014) suggested that Cambodia's human capital is still weak and outdated to the new industry to come which needs to improve, with respect to reform and interventions of its education system and vocational training. As Srinivasa Madhur (2014) shows, a shortage of skilled human resources for low-to-medium skill intensive industry can be seen through two educational gaps; a schooling gap and learning gap (Madhur, 2014). Respond to this, the study by Rana, Ardichvili and Taing (2016) on Cambodia's national human resource development in transition recommends that the Kingdom has to improve all forms of education and address skills gap and education with the promotion non-formal education and lifelong learning as well as engage the key stakeholders in order to better integrate in the ASEAN community (Rana, Ardichvili, & Taing, 2016).

The Emerging Utilization Of 4.0 Technology

Tech adoption has seen a widening of the skills gap as training and education haven't been able to keep up. This will only be exacerbated in the future without adequate address. As Chang and Huynh (2016) projected a ten years of technology

trend and industry change, the future of jobs at risk of automation in the five ASEAN nations; Cambodia, Indonesia, the Philippines, Thailand and Vietnam has deepened its trade integration in the global market and made shifts from agriculture to manufacturing and service (Chang & Huynh, 2016). Approximately 56 percent of all employment in the ASEAN-5 is at high risk of displacement due to technology over the next decade or two which the most affected will be the wage workers. In addition, the industries which low automation risk across the ASEAN-5 include education and training, human health and social work. With respect to Cambodia, the Industry 4.0 only gives opportunities to people that can catch up with technology. The condition of not up-to-date technology and facilities still constrains the school infrastructure which leads to the low educational qualification and standard. Ultimately, the country could not produce skilled workers to equip in the market requirements.

Responding to Manufacturing Industry (Structural Economic Change)

In the context of a dynamic developing country, which is moving from relative dependence on agricultural production to manufacturing and service sector, workers also need to learn new technical, entrepreneurial and social skills (Sparreboom & Staneva, 2014). For, Cambodia has to foresee on future skills that will come through technology which training institutions have to prepare training to equip skills to next generation responding the requirement. To identify skills that no longer use labor force, it has to be forecasting through digital and ICT skills that is eligible in all sectors (*K. Leav, personal communication, October 2, 2019*). Since the traditional or non-formal economy is often associated with lower levels of education and skills (Sparreboom & Staneva, 2014), it requires skill training to equip workforce to catch up when industry and service sector are increased. The training needs to be up to date (not based on the tradition of work) (*R. OU, personal communication, September 25, 2019*). Experiencing of structural change that is often accompanied by rural-urban migration, international migration flows, it may also interact with skills and influence skills mismatch (Masson, 2001). Answering to this

matter, the government has to create more skill workers and prohibit migration to other countries through promoting and advertising TVET and push students to study TVET by guaranteeing job for them after they graduated (*TVET Expert, personal communication, October 7, 2019*).

Transforming Cambodia From Labor Intensive to Skill Intensive

Under the Royal Government of Cambodia (RGC), Cambodia Industrial Development Policy 2015-2025 was implemented in order to transform a labor-intensive industry to a skills-driven industry by 2025 through connecting to regional and global value chain (Royal Government of Cambodia b. , 2015). Alongside the National Employment Policy 2015-2025, to improve livelihood and address the dignity of the people and social harmony by providing them with equal opportunities of decent and productive employment (Cambodia, 2015), the National Technical Vocational Education and Training Policy 2017-2025 (Cambodia, 2017) was also implemented to help the RGC achieves her goal. The goal of TVET Policy is to improve the livelihood and dignity of people and to enhance Cambodia workforce or human resources with knowledge, competence skills, working attitudes, professional ethics, high productivity and competitiveness for lifelong employability (Cambodia, 2017).

The Ministry of Education, Youth and Sport (MoEYS) and the Ministry of Labor and Vocational Training (MoLVT) are the main state institutions to produce human resources through education and training, MoEYS is responsible for academic stream while the professional stream, with respect to TVET, is under the leadership and responsibility of MoLVT (Chet, 2006, p. 20).

The Ministry of Education, Youth and Sport has potentially influence in general education, especially in primary and lower secondary education. To produce skill workers to meet existing and future potential work requirements, the ministry has to ensure that children don't repeat class (grade) and don't drop out from school because of economic and other factors. In terms of teacher, there requirement to

improve quality, too (*S. Kouch, personal communication, October 8, 2019*). At the same time, the Ministry of Labor, Vocational and Training has roles to skill, upskill, and reskill youth to prepare them for the labor force. These skills are provided in the form of Technical and Vocational Education and Training (TVET) both informal (short course) and formal (long courses). To equip and upgrade skills of Cambodia's labor force to fill the growing domestic and regional labor demands for low and moderately skilled workers, TVET is the most important labor market program, providing skills training to individuals of working age (18-59) in informal employment who dropped out of secondary school (OECD, 2017). Though TVET programs are the main labor market intervention, the coverage is low (OECD, 2017). It has to be TVET focus to ensure lifelong learning by creating a bridging course to graduate from lower secondary to upper secondary in TVET (*S. Kouch, personal communication, October 8, 2019*). It requires equivalent training programs for unskilled and students who are not eligible to enroll in TVET; BEEP program is an example (Leav, 2019). Moreover, improving and promoting the quality of TVET is also important step to address the low enrolment rate.

In the broad picture of Cambodian economy, diversifying economic based existing industry; agriculture, tourism, textile, and construction; needs STEM education and skills to move on (*R. OU, personal communication, September 25, 2019*). It needs to focus on the formal TVET since it aims to support the industry, private and investment sector that establish in Cambodia which is to produce skill workers with flexibility (*S. Thorng, personal communication, November 4, 2019*). Though Cambodia has policies to push students to learn in STEM education, employment policy needs to align in order to ensure they are employed after they graduate from these skills with a strict limited number of foreign employees in this field (*R. OU, personal communication, September 25, 2019*). Alongside this, the study on labor requirement; the skill needs and supply; is also important to prepare human resource (skilled workers) in order to attract huge investment in the long-term prediction as some skills such as machine or electricity need not less than three

years to learn. Infrastructure, some regulation and electricity are added factor to attract more investment (*R. Khleang, personal communication, October 10, 2019*).

Policy Recommendations

This section discusses the policy options that help the Royal Government of Cambodia addresses the skills issues which will respond to the industry's requirement. Education and training policies should be considered in a broader context improving the links between education, training and the world of work through social dialogue on labor market needs, and beyond the labor market in terms of macroeconomic and development policies that focus on job creation (Sparreboom & Staneva, 2014). In Cambodia, the Industry 4.0 only gives opportunities to people that enable to catch up with technology. Science classes, namely STEM subjects, are in need in the future skill requirement, however the enrolment in these subjects is still low while most of Cambodian students enroll in social classes with the perception that social subjects are easier than science ones.

In addition, technical teachers; who have expertise in technical skills; don't want to work for the public sector because the private sector dominates the sector through offering them higher benefits. It significantly shows that public TVET programs haven't affected and functioned well to respond the labor market requirement in regard to low quality, outdated facility, low student enrolment, and less interest from students. As Lamia (2018) suggested, TVET has not had a significant positive impact on the economic outcome and social well-being of disadvantaged and marginalized groups in the ASEAN region with several challenges; low participation rate, primarily due to low public spending, poor quality, especially in countries with low national income like Cambodia, weak TVET relevance, owing to lack of engagement of key stakeholders, especially the private sector (Lamia, 2018).

According to the 2017-2018 academic year data from TVET Management Information System, only 17,097 TVET graduates with 10,257 of female counterpart get job six-months after their graduation (MOLVT, 2019). It is not the problem of

enrolment rate alone, but a better TVET program; quality; is also sceptical since it affects the long-term employment of students. This implication pushes the Cambodian government to promote and improve TVET program in order to fill the gap of skill industry's requirement and mitigate the job risk, low-skill employment in particular. Though the civil society or non-governmental organizations also provide TVET program, private sector and the Ministry of Labor and Vocational Training have to be key actors in this matter under the following policy options.

First, the Directorate General of TVET has to promote TVET by creating the good environment between the public and private sector with the industry engagement through Public Private Partnership (PPP). Because TVET in Cambodia is still weak and haven't answered to the qualification of apprenticeship, the kingdom needs to design apprenticeship system in a form of national recognition and framework that needs participation from the private sectors (*R. Khleang, personal communication, October 10, 2019*). According to the Cambodian Labor Law, the article 57 stipulates precisely that "*Any enterprise employing more than sixty workers must have the number of apprentices equal to one-tenth of the number of the workers in service of that enterprise.*" (1997).

The public TVET institutions needs to build trust and work closely with the private sector, not only getting the financial and facility support, technical support is the most prioritize. Linking PPP is important to meet demand of industry by engaging private sector to consult when the new training program is design. Full participation from some enterprises is limited since they lack incentive and encouragement to participate (*TVET Expert, personal communication, October 7, 2019*). PPP assists public sector to provide affective training in the form of on-the-job training or on-service training where students can get first-hand experience while they are in the training program. In doing so, students will be specialized and confident in skills they are trained. Most importantly, it will secure them employment after they graduate. The current PPP is voluntary involvement from the private participation (*S. Thorng, personal communication, November 4, 2019*), particularly in student internship program. It should be seen in the form of

compulsory of internship or voluntary program when TVET students are in the last six months or last year of their training program. In order to achieve this, it requires the DGTVET mutually interacts with the private sector. It needs to create the working environment that guarantee the employment of graduate students to work there as the incentive to the company. It needs a certain policy from the ministry to make sure that TVET graduate students work at the private sector with proper benefit according to the labor market standard. The ministry has to share authority and responsibility to private sector, so it can take ownership in providing training as the private sector is the real skill demand side who know what skills they need and creates program to train certain number of trainees to work for their enterprise (*TVET Expert, personal communication, October 7, 2019*). On the other hand, if the quality of on-the-job training is poor, this is an opportunity for the TVET institution to offer training support for employers and staff to upgrade skills and provide more effective products or service delivery (UNESCO, 2013).

Since the National Training Board (NTB) has overall responsibilities for the TVET system, the curriculum needs to be designed with response of the industry engagement with a friendly environment of private participation. Further, the study of skilled requirements in the industry is needed to consider with the strategies based geographical area. Prior to establish the TVET institution and design any TVET program, the study curriculum needs to align with skills demand of each location or province. Through this, it will answer a responsive TVET program to the industry with the right skills persons into the industry.

Second, in preparing human resources to respond to the trend of globalization and industrialization, a flexible TVET curriculum needs to align with the trend of digital technology or the Industry 4.0. Due to the lack of local talent, Cambodia is in dire of semi-skill and skill workers in supplying them into the Multinational Corporations (MNCs). Increasing technology and putting it into the study curriculum is what the DGTVET has to take into account. Students need not only first-hand experience when they are in classes, but they also need up-to-date facility, technologically and digitally. Through this, it will help them stay up to date

and able to work effectively after their graduation, particularly from TVET schools. It helps the Kingdom from hiring foreign workers but increase skill employment for Cambodian local.

Third, Labor Market Information needs to improve through establishing TVET and Career Council Center in high school, so information gap can be addressed. Because the flow of information prohibits information of TVET to students and students' parents, their perception remains unchanged. The NEA needs to play an important role making sure that labor market information is resourceful to both employers and employee side. It has to offer and update employment information of Cambodian job market by providing the Career guidance, vocational orientation and counselling in this high school career council center. It has to make sure that there is not only the public service in terms of job vacancy, but it should include the awareness and information consultant for the TVET purpose. In each high school, there require a TVET consultant plus the job market consultant to high school students prior to choose whether formal education or TVET.

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Appendix

Key Informant Interview Questions

Topic: Cambodia Labor Market and Skills Gap

This research questionnaire is undertaken for the purpose of fulfilling the empirical requirements of the Future Forum Young Researcher's Program, as part of my Individual Project. The specific focus of this project is detailed below in the research overview.

Research Overview

Research Objective:

- To identify the current skills gap in the Cambodian workforce.
- To identify policy solutions that will support the preparation of the Cambodian workforce in its transition towards industrialization.

Research Question:

How can Cambodia education be designed in order to facilitate the necessary skills for the diversification of Cambodian industry?

Sub-research Question:

- What factors determine skills gap?
- What are the skill requirements in the Cambodian labor market?
- What will be the needs placed on the education and training system in response to the rise of manufacturing industry and industrialization?

Semi Interview – Key Informants

Stakeholders

Key informants to interview are from different institutions that work on the relevant issue of ensuring that citizen's skills are developed suitably for employment. These include state institutions – MoLVT (NEA and DGTVET), IGOs/ INGOs – UNESCO, ADB, ILO, and youth community platform - Sourmouy.

State Institutions	MoLVT – NEA and DGTVET
IGO/INGO	UNESCO, ADB, ILO
Youth Community Platform	Sourmouy

Purpose of Key Informant Interview

This interview aims to identify the main barriers or challenges that are preventing the skills/qualification to workers/students and to seek the perception from the relevant stakeholders about current issues and what they see as the policy solution. It will focus on thematic areas that are critical to workforce and education.

Section I: Situation on Cambodia labor market

2. What skills do you believe are in short supply in the Cambodian labor market?
3. In your opinion, what factors determine a skills gap?

4. What are the main challenges for the Cambodian workforce prior to enter the job market?
5. How well prepared or competent are recent graduates for entering the job market?

Section II: Prospect on skill industry

1. How does industrialization 4.0 impact the skills requirements of a growing Cambodian economy?
2. In the next 10 years, what skill demand do you see in Cambodia skill industry?
3. In your opinion, what skills will employers look for?

Section III: Response to skills industry

1. Transforming Cambodia from the labor intensive to skill intensive is the Royal Government of Cambodia's prioritized agenda: what are the key steps that need to be taken to ensure that this priority is met?
2. What should be improved to respond to the trend of this manufacturing industry?

Section IV: Agency Specific

1. In your opinion, what are the **government's /NGOs' roles (stakeholders)** in promoting/providing skills to students and workers?
2. What are the main barriers your institution challenges in providing skills to them (students and employees)?

Finally, are there things that I should have discussed, but haven't yet discussed?

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