Interim Report

Skills Demands in the Dual Labor Market of Formal and Informal Sectors: Findings from a Skills Assessment of Garment Workers in Ghana

Skills and Knowledge for Youth Project

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1 Introduction

1.1 Purpose of the research

Ghana's economy has been growing steadily since the beginning of the 2000s and continued to expand through 2019. Between 2000 and 2019, GDP per capita increased from US$952.80 to US$1884.30 (aggregate based on the constant 2010 U.S. dollar). While the economy was boosted by the discovery of oil in 2007, non-oil industries also contribute to the recent growth. For example, the share of the service sector grew significantly from 28.8% in 2000 to 44.1% in 2019 (World Bank 2020). Meanwhile, the contribution of the manufacturing industry to the national economy has been limited (9.0% to 10.4% in the same period). This situation is worrisome given that the enhanced competitiveness of the private sector, particularly light manufacturing and agroprocessing, is a priority of the Ghana Shared Growth and Development Agenda II (Government of Ghana 2014a, 18). In an effort to promote private-sector-led growth, the government points out the divide between the formal and informal sectors and the importance of strengthening the capacities of business owners and workers in the informal sector through training on entrepreneurship and technical skills.

Along with this observation of needs, it is natural that the government of Ghana has highlighted the importance of industrial skills development, particularly in the light-manufacturing sector, such as garment or food processing, and for informal workers. It was in 2007 that the Ghanaian government started the current technical and vocational education and training (TVET) reform. Since Ghana's independence in 1957, the Ghanaian government has initiated reforms of TVET a few times, including a reform in 1986 that led to the establishment of the network of National Vocational Training Centers. The motivations for such reforms were to enhance the productivity of the economy and employability of individual workers through skilling up (Akyeampong 2005). In this history of TVET reforms in Ghana, the current one is one of the most fundamental, involving significant changes in the school system, accreditation, curriculum, and certification.

Following the global trend to shift from curriculum-based to competency-based training, the national parliament of Ghana passed the Council for TVET (COTVET) Act in 2007, and the comprehensive reform of the formal and informal skills development system has been in progress under the initiative of COTVET. COTVET has led the process of developing

occupation standards for respective vocational skills, the national TVET qualification framework, and accreditation standards for the providers of education and training (Darvas and Palmer 2014, 5; Government of Ghana 2014b, ix; COTVET 2012). With support from donors such as the World Bank, the Africa Development Bank, and bilateral aid agencies of Germany, Belgium, and Denmark, the skills development fund was established in 2012 to implement so-called competency-based training (Darvas and Palmer 2014, 5; Government of Ghana 2014b, ix; COTVET 2012).

Economic growth has brought about improved employment rates. In 2001, 10% of the labor force was unemployed, and the unemployment rate of youth between 15 and 24 years old was as high as 15.9%. But the rates improved to 4.3% and 9.2%, respectively, by 2019 (World Bank 2020). Regardless of this positive prospect, the unemployment rate for TVET graduates is high, and little scholarly effort has been expended to empirically identify the exact types and domains of skills in which supply-demand mismatches happen. Despite a great deal of effort of the Ghanaian government to increase the effectiveness of the skills development system, there are ceaseless complaints from both the training institutions and employers about mismatches of expectations and limited collaboration (Yamada forthcoming). This mismatch is a perennial problem inherent in the formal preservice training of workforces across the world despite recent efforts of international development partners and developing country governments to reform TVET according to the concept of competency-based training and to promote the participation of industry stakeholders in designing the framework for skills assessment.

As a means to break away from broad criticism of the mismatch between training and employment, the Skills and Knowledge for Youth (SKY) Project of Nagoya University contributes by providing concrete evidence of mismatches using the skills data collected uniquely by the project. The approach of the SKY Project is to contrast the skills possessed by workers to the ones demanded by employers and trained for by TVET institutions. The focus is on the skills, rather than the structure of the training system or job matching. The reason for this emphasis on skills is that skills are the foundation of the system's relevance, after all. Once we grasp the real nature of the skills mismatch, reform plans can be more targeted and precise.

So far, the study has mostly focused on factories, TVET colleges, and informal workers in the vicinity of the capital city, Accra, and the sample size is relatively small. Still, with its unique research module, composed of several types of interrelated questionnaires and worker skills assessments, the project has made it possible to compare the opinions of different parties,

concurrently and objectively, with the actual performance of workers in the workplace. In summary, this study can examine the following:

- What kinds of mismatches exist between the skills expectations of employers and those of training providers?
- Do the actual skills that workers have match the expectations of employers and trainers?
- What levels of skills do informal-sector workers have, and what kind of differences in skills exist from those of factory workers?

The study is designed to grasp the detailed contents of actual and expected skills comprehensively. Our module allows us to examine the interrelated effects of the following categories of skills on workers' productivity:

- **Cognitive skills:** Basic literacy such as reading, circulating, and information gathering
- **Vocational skills:** Skills that are directly related to vocational majors, including both theoretical and practical skills
- **Noncognitive ("soft") skills:** Applying knowledge, conducting appropriate interpersonal relations, following rules, and making judgments to achieve a required result

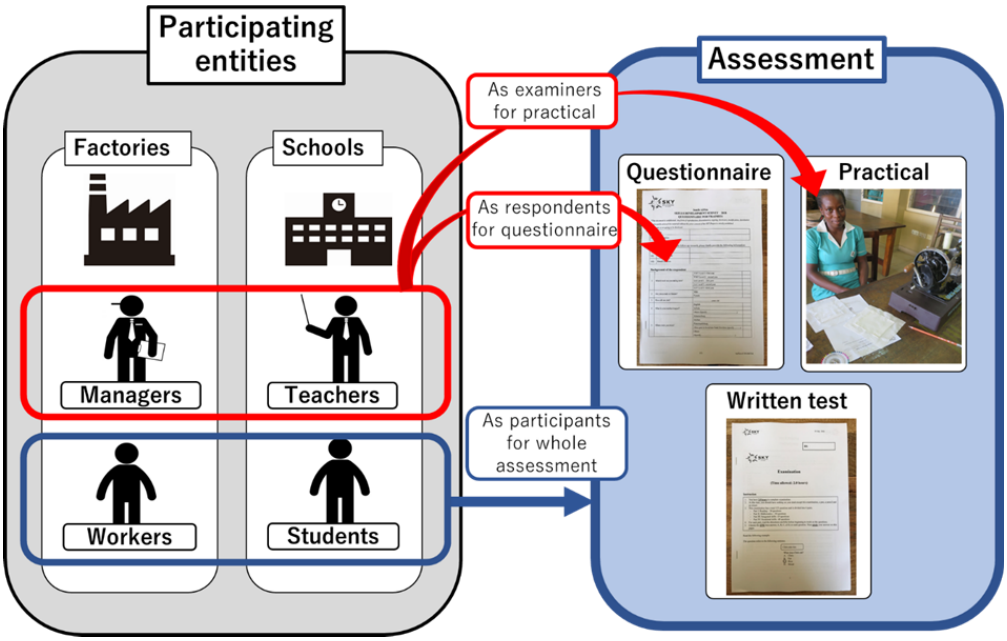
1.2 Design of the research

1.2.1 What our unique assessment module can do

To measure the perception gaps between the supply and demand sides and explain why mismatches occur, we developed a unique instrument that captures the knowledge and skills of TVET trainees and workers in real environments. The SKY assessment module consists of three parts: practical test, written test, and questionnaire. Furthermore, there are four kinds of questionnaires, each of which is designed for a specific purpose: questionnaires for (1) employers, (2) TVET trainers, (3) workers, and (4) TVET trainees.

Figure 1 shows the structure of the assessment. The arrows show which participant will be involved in which parts of the assessment. Workers (in both the informal sector and factories) and trainees in TVET schools participate in all three parts of assessment: (1) questionnaire, (2) written test, and (3) practical test. Factory managers and trainers in TVET schools take part in the questionnaire as respondents and in the practical test as examiners.

Figure 1 The structure of the assessment and the role of the stakeholders



Source: Figure from Skills and Knowledge for Youth Program assessment manuals.

Here, we would like to present more detail about the contents of the practical test. The practical test, as shown in Table 1, is composed of four activities: cutting, sewing, ironing (10 minutes each), and application (20 minutes). For each activity, there are 5 to 11 evaluation points to assess the skills of examinees. The assessor grades the skills of examinees using a Likert-type scale from 1 (*could not do well*) to 5 (*excellent*). Figure 2 is an image of the first page of the evaluation sheet that assessors use to score examinees.

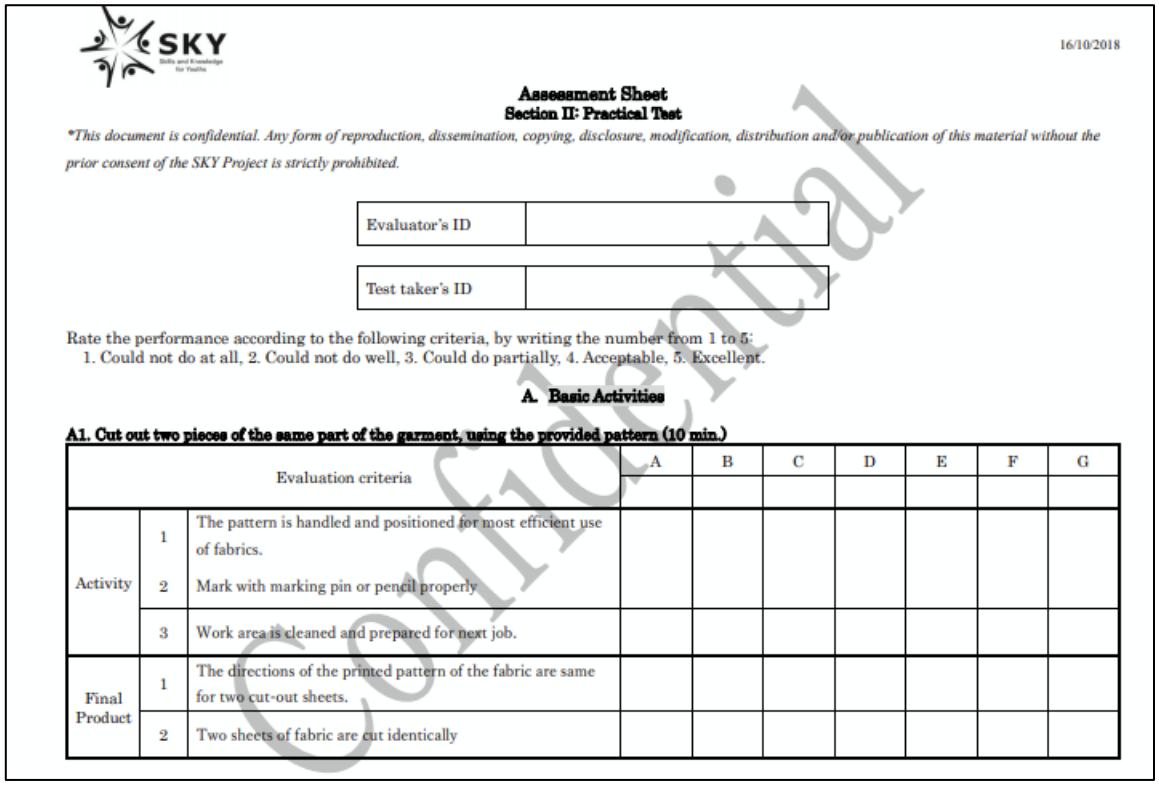
Table 1 Activities in practical test

No.	Activity domain	Contents of activity	Number of evaluation points
A1	Cutting	Cut out two pieces of the same part of the garment, using the provided pattern (10 min)	5

A1	Sewing	Sew two sheets of fabric along the marked line (10 min)	7
A3	Ironing/finishing	Iron and fold the prepared Y shirt (10 min)	6
B	Advanced (pocket making)	Make the same pocket as the sample. A sample pocket is provided for each person. (20 min)	11

Source: Skills and Knowledge for Youth Program assessment module.
Note: No. = number; min = minutes.

Figure 2 Sample image of the evaluation sheet



SKY

16/10/2018

Assessment Sheet
Section II: Practical Test

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Evaluator's ID	
Test taker's ID	

Rate the performance according to the following criteria, by writing the number from 1 to 5:
1. Could not do at all, 2. Could not do well, 3. Could do partially, 4. Acceptable, 5. Excellent.

A. Basic Activities

A1. Cut out two pieces of the same part of the garment, using the provided pattern (10 min.)

Evaluation criteria			A	B	C	D	E	F	G
Activity	1	The pattern is handled and positioned for most efficient use of fabrics.							
	2	Mark with marking pin or pencil properly							
	3	Work area is cleaned and prepared for next job.							
Final Product	1	The directions of the printed pattern of the fabric are same for two cut-out sheets.							
	2	Two sheets of fabric are cut identically							

Source: Skills and Knowledge for Youth Program assessment module.

The reason we combine several types of assessments (questionnaire, written test, and practical test) is that we believe the demand-supply gap should be understood at two levels: (1) perception gap and (2) gap in actual skill. The questionnaire allows us to compare differences in expectations.

Figure 3 shows the conceptual framework of our module. As presented in the figure, we examine the gap using the questionnaires and practical test. In the practical test, assessors from the employer side and the TVET trainer side concurrently grade the vocational skills of the same examinees (workers and trainees). Questionnaires allow us to compare the perceptions of each stakeholder, including self-evaluations of trainees and workers and expectations of

trainers and production managers. However, knowing "what they think" is not enough unless we examine how it is translated to actual performance and evaluation. Thus, one of this study's methodological strengths is that its design allows us to contrast stated expectations/notions with actual performance/evaluations.

Figure 3 Conceptual framework of the skills assessment module

Source: Skills and Knowledge for Youth Program Project Website.

1.2.2 Participants and schedule of the assessment

So far, the study mostly has focused on people working and learning in factories, informal workshops, and programs of TVET institutions relevant to garment production in the vicinity of the capital city, Accra. The assessment conducted from 2018 to 2019 involved workers and trainees at two factories (Factories A and B), four TVET institutions (Schools A, B, C, and D), and informal workshops that belong to the Union of Informal Workers Associations. Table 2 presents the demographic information of the participants while Table 3 shows the characteristic of participating institutions.

Table 2 Background information about participants, by affiliation

Background information	Trainee	Employee	Informal	Total
Gender (female = 1)	0.90	0.80	0.89	0.87
Age	21.16	29.63	35.70	26.35
Economic level of household	6.13	6.72	5.88	6.21

Work experience before entering TVET	0.35	—	—	0.35
Work experience before current job	—	0.87	0.39	0.61

Percentage of attained education level		Employee (%)	Informal (%)	Total (%)
No formal education	—	0.16	3.34	1.83
Primary	—	0.32	15.55	8.30
Junior high	—	37.22	68.02	53.35
Senior high	—	36.10	10.03	22.45
Tertiary	—	20.13	2.03	10.65
TVET (Levels 1–4)	—	2.56	1.02	1.75
Other	—	3.51	0	1.67
Total	—	100	100	100

Source: Data from Skills and Knowledge for Youth Program assessment.

Note: TVET = Technical and Vocational Education and Training. Dashes indicate no respondents.

a. 0 = male, 1 = female.

b. Average.

c. Aggregate factor scores of DVD/CD player, TV, cell phone, computer, car, motor, and refrigerator/freezer.

Table 3 Characteristics of participating institutions

Training sector						
School	**Level of school**	**Type of school**	**Certification provided**	**Location**	**Number of trainees**	**Number of programs**
A	University	Public technical university	Degree, HND	In Accra city	11,437	21 bachelor programs and 16 HND programs in 5 faculties
B	NFQ Levels 1–4	National vocational training institute	Certificate 1, 2	Suburb	1,231	18 programs (including 4 advanced/technician courses)
C	NFQ Levels 1–4	National vocational training institute	Certificate 1, 2	Suburb	—	10 areas of programs
D	NFQ Levels 1–4	Private TVET institute	Certificate 1, 2	In Accra city	550 (Approximately)	9 areas of programs

Industrial sector								
Factory	**Location of headquarters**	**Foundation**	**Firm's legal status**	**Number of managers**	**Total number of workers**	**Type of business**	**Country to export**	**Acceptance of industrial attachment**
A	In Accra city	2012	Publicly listed company	5	59	Both export and domestic	USA	Yes (15 trainees in 2019)

B	In Accra city	1997	Publicly listed company	8	180	Both export and domestic	USA and UK	Yes (22 trainees in 2019)

Source: Compiled by Skills and Knowledge for Youth Program members.
Note: NFQ = National Qualification Framework; HND = Higher National Diploma; TVET = Technical and Vocational Education and Training. Dash indicates no information available.

In terms of the demographic information about the participants, Table 2 shows that 87% of the participants were female, and the percentage of female participants is higher for TVET trainees and informal workers (90% and 89%, respectively) than for factory workers (80%). Compared to factory workers, informal workers are older, with an average age of 26.35. In terms of age, TVET trainees are the most homogeneous group; their ages range from late teens to early 20s. Economic level here is based on items/facilities respondents have. We asked whether they have the following items in their houses and gave one point to each item, aggregating the score to show the economic level of the household: DVD/CD player, TV, cell phone, computer, car, motor, and refrigerator/freezer. When it comes to work experience, 35% of TVET trainees had work experience before entering their current schools. There is a big gap when we compare the work experience of factory workers and informal workers. While 87% of factory workers had other work experience before starting at the current factory, only 39% of informal workers had work experience before their current jobs. This indicates that most informal workers joined the informal-sector business as their first jobs after schooling. In terms of education level, the informal workers have the lowest education level, given that TVET trainees are currently enrolled in the TVET institutions at the secondary and postsecondary levels. Nearly 70% of informal workers finished their education at the junior high school (JHS) level. Meanwhile, in the formal factories, 37% are JHS graduates, 36% completed senior high school (SHS), and 20% graduated from tertiary education.

Table 3 shows the characteristics of participating institutions: TVET schools A, B, C, and D and Factories A and B. Among the four TVET schools, apart from School A, which is a technical university, three schools are at TVET Levels 1 through 4, providing certificates I and II. While Schools A, B, and C are public institutes, only School D is a private TVET institute. Two schools (Schools A and D) are in Accra city, while the other two (Schools B and C) are located in suburbs near Accra city. The two participating factories are located in Accra city. Factory A was founded in 2012 as the sister company of a well-known Ghanaian fashion house that was founded in 1996, while Factory B was founded in 1997. Both factories produce products for domestic and international markets. Factory A export products to the United States, while Factory B exports to the United States and the United Kingdom. Factories sell their products to private individuals, small businesses, and overseas retailing companies. They produce school uniforms, hospital scrubs, overalls, dresses, and shirts for gentlemen, ladies, and children. According to the questionnaire for human resources managers, both factories usually provide on-site training by inside trainers to their workers. Though the contents of

training vary, both factories provide training on work ethic and quality control to improve production quality.

Table 4 summarizes the collected data, such as the periods and types of assessment, participating entities, number of participants, and contents of the survey. The survey with the TVET participants was conducted in 2018, and 331 trainees and 8 trainers from four TVET institutions were involved. The survey on the side of industry was conducted in 2019, and 62 workers from two factories and 92 informal workers were involved.

While the number of participants taking the written test and answering the questionnaires is the same for each population group, the number taking the practical test is smaller. This was due to the arrangements necessary for the practical test, such as preparation of equipment and materials and involvement of several examiners for two consecutive days. To meet the conditions required for the quality of the results, the number of participants had to be smaller. To avoid bias in the selection of people who take the practical test, we applied the random sampling formula to the participant lists for the written test and questionnaires.

Table 4 Summary of collected data

Training sector						
Component	**Period conducted**	**Survey type**	**Type of participants**	**Participating entry**	***n***	**Contents**
1	November 2018	1. Questionnaire	TVET trainees	Four TVET institutions (three are at NFQ Levels 1–4, one is at NFQ Level 5)	331	● Socioeconomic background ● Personality ● Job aspirations ● Perceptions of curriculum ● Self-evaluation of skill
2		2. Examination	TVET trainees		331	● Reading ● Mathematics ● Integrated skill ● Vocational knowledge
3		3. Practical test	TVET trainees		160	Four activities related to ● Sewing ● Pattern making ● Garment structure ● Ironing, finishing
4		4. Questionnaire	TVET trainers		13	● Demography ● Curriculum ● Expectations for/general evaluations of the trainee's skill
Industrial sector						
Component	**Period conducted**	**Survey Type**	**Type of participants**	**Participating entry**	***n***	**Contents**
5	February 2019	1. Questionnaire	Factory workers	Two domestic factories	62	● Socioeconomic background ● Personality ● Job aspirations ● Self-evaluation of attitude at work

						• Self-evaluation of skill
6		2. Examination			62	Same as trainees'
7		3. Practical test			62	Same as trainees'
8		4. Questionnaire	Factory employers (production manager/human resources managers)		11	• Factory characteristics • Demography of factory workers • Training of workers • Expectations for/general evaluations of workers' skill
9		1. Questionnaire	Informal workers	Informal workshops in Accra vicinity	92	Almost the same as factory workers'
10		2. Examination			92	Same as trainees'
11		3. Practical test			91	Same as trainees'

Source: Compiled based on data from Skills and Knowledge for Youth Program assessment.

Note: TVET = Technical and Vocational Education and Training; NFQ = National Qualification Framework.

2 Context of skills development in the garment sector of Ghana

2.1 Macroeconomic outlook and labor market in Ghana

The commercial production of oil started in 2012, which boosted the economy of Ghana, and the employment situation also improved. It is worth noting that much of the growth in the industry has been propelled by mining, quarrying, and increases in upstream petroleum by 80.4%. Non-oil industries also have contributed to the recent growth. For example, the share of the service sector grew significantly from 28.8% in 2000 to 44.1% in 2019 (World Bank 2020). Meanwhile, the contribution of the manufacturing industry to the national economy has been limited (9.0% to 10.4% in the same period). The share of agriculture decreased significantly from 35.3% in 2000 to 17.3% in 2019.

In 2001, 10.0% of the labor force was unemployed, and the unemployment rate of youth between 15 and 24 years old was as high as 15.9%. But the rates improved to 4.3% and 9.2%, respectively, by 2019 (World Bank 2020). At the same time, employment in the manufacturing sector shrunk from around 10.0% to 8.1%, in contrast to the service sector, which expanded with the oil boom (Aryeetey et al. 2014, 233). This fact indicates that oil exports raised domestic consumption in the short run but hasn't strengthened the basis of value-added production and that the relative contribution of manufacturing in the national income has reduced. It also suggests that the current growth is fragile, depending on the export price of the raw materials. For long and stable economic growth, the development of mid- to high-level technicians is considered more significant than ever. The data also show that a substantial part of the workforce in the agriculture sector has shifted to the service sector but not so much to the manufacturing sector. The practical implication of this situation is that a large amount of the rural population migrated to urban areas to be involved in petit trading or some minor service work. The informal sector is the primary receptor of such migrant workers, whose skills development is a serious concern for the stability of employment.

2.2 Garment industry and skills demands in Ghana

In Ghana, the garment sector is dominated by the informal sector (Japan International Cooperation Agency 2008; Ghana Statistical Service 2016). Entrance into the business is relatively easy and requires little capital and minimal skills (International Labour Organization 2015). One requires merely design flair, sewing skills, and a small amount of working capital to start a business in the garment industry. As a result, the garment sector dominates Ghana's manufacturing sector (Quartey 2006; Japan International Cooperation Agency 2008). Hinshaw (2012) indicates that Ghana was becoming a global destination for manufacturing clothes but admitted the team of self-taught needleworkers (informal-sector small-scale business) lack skills in mass production.

Studies have highlighted that growth and development in the garment industry during the past few years has been declining gradually. Estimates suggest that, around the 1960s, the sector comprised more than 20 large-scale textile factories and employed more than 25,000 Ghanaians. Evidence indicates that the garment industry's total output peeked at about 129 million yards in 1977. This declined to 44 million yards by 2009 and subsequently 42 million in 2011. Currently, the garment industry has only four large-scale textile factories and employs fewer than 2,500 workers (Bruce-Amartey, Amissah, and Safo-Ankama 2014).

Recently, this industry has seen some signs of revival, facing the prospect of export to the United States with the reduced tariff stipulated in the African Growth and Opportunity Act. In 2017, the Association of Ghana Apparel Manufacturers was established to promote the export-oriented growth of this industry. Also, the United States Agency for International Development launched a program to support this industry in the same year; it provided technical and financial support to manufacturer Dignity DTRT, which resulted in the creation of 1,100 new jobs there (United States Agency for International Development 2017). In sum, although the size of production is not significant yet, there is a growing interest in apparel export. Together with the informal tailors and workshops, it is important to consider the skills demands in this broad industry overarching both informal and formal sectors.

2.3 TVET system in Ghana

Ghana has had a relatively high level of educational achievement among African countries, being an educational center of British West Africa. As of 2005, its gross primary school enrollment rate was as high as 83.4%, which is 108.5% in 2014. Also, the promotion rate of primary school trainees to JHS, up to which education is compulsory, is 93.8%. The

promotion rate from JHS to SHS drops sharply to 45.8%. Even though it improved from 25.5% in 2005, there is a significant bottleneck of academic education between JHS and SHS, and many JHS graduates choose other career tracks than SHS (Ghana Education Service 2006, 2015). While approximately half of JHS graduates do not proceed to SHS, it is only 12% who are absorbed into TVET institutions. There are no accurate data about other nonschooled youth, but one can assume that they are in apprenticeship, in informal employment, in household work, or idle (Government of Ghana 2014b, 2–11). According to an estimation, more than 440,000 youth are learning skills in informal apprenticeship. If this is true, the ratio of apprentices to TVET trainees is 4:1 (Darvas and Palmer 2014, 6; Palmer 2009).

Not only the site of skills development but also a large part of employment is in the informal sector. According to the 2010 national census, 93.0% of employment was in the private sector, out of which 86.1% was informal. Thus, formal private-sector employment was only 7% (Government of Ghana 2010), and the majority of TVET trainees conduct industrial attachment in the informal sector. Moreover, it is not very common for TVET graduates to get formal-sector employment, at least immediately after school. The government expects TVET to play an active role in bridging the polarized economy and widening the basis of formal-sector employment (Government of Ghana 2014a). In this situation, TVET institutions promote entrepreneurship for trainees instead of employment by private companies or governmental bodies. There is grant support for those TVET graduates who fulfill certain conditions and open businesses (Government of Ghana 2014b, ix–2).

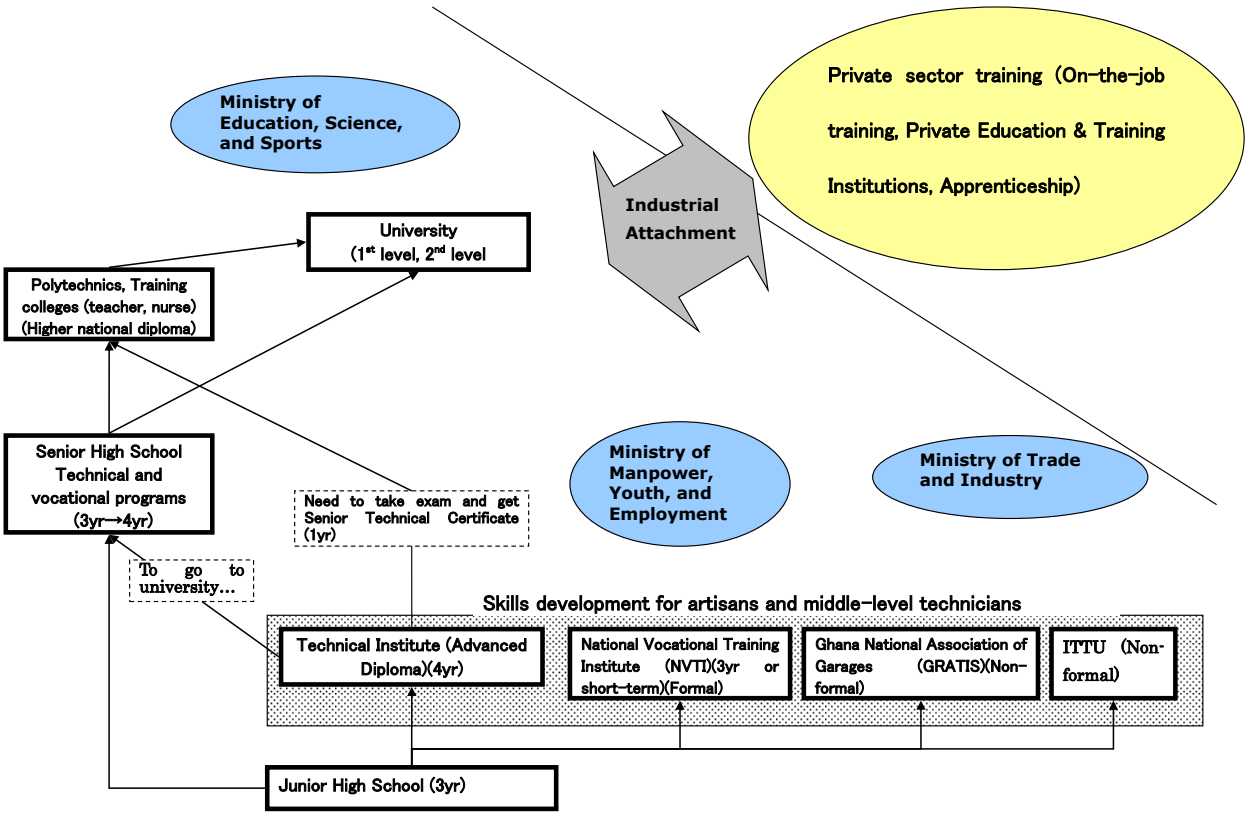
In Ghana, there are more than 200 public TVET institutions run by the government—in addition to private ones. Figure 4 includes only major categories of TVET institutions. After they complete basic education (JHS), graduates' educational paths become diverse, even among the ones who continue schooling. As mentioned earlier, only about 45% of JHS graduates can proceed to SHS. Others will go to TVET institutions, engage in informal skills training, or remain not in education, employment, or training. In Figure 4, the shaded horizontal area shows those TVET institutions that JHS graduates can choose. In addition to the technical and vocational courses of SHS, the Ministry of Education (MOE) runs technical institutes (TIs) for those with basic education certificates. TI is oriented toward training middle-level technicians and allocates more time for practical training and theories of specific vocational fields than technical and vocational courses of SHS. When one completes the TI, he or she can get a senior technical certificate, which is different from the SHS diploma. To proceed to a polytechnic, which is the tertiary education in the technical/vocational track, one needs either

a SHS diploma or a senior technical certificate. SHS graduates also can apply to universities, while TI graduates with senior technical certificates cannot apply to universities directly but have to go through either a SHS or a polytechnic. There are 45 public TIs in Ghana, and Kumasi Technical Institute, which is one of the samples for this study, is among the top in academic ranking.

A characteristic of TVET is that there are many education and training institutions that are run by ministries other than MOE. There are 116 institutions—the largest number—run by the Ministry of Employment and Labor Relations; however, most of them are small in scale. Therefore, in terms of enrollment, 70% of public TVET trainees are in TIs supervised by MOE (Darvas and Palmer 2014, 48–49). Among the TVET institutions under the Ministry of Employment and Labor Relations, national vocational training institutes (NVTIs) are the most widely distributed and well known among the public. In addition, there are institutions under the Ministries of Youth and Sports, Trade and Industry, Local Government and Rural Development, Fisheries and Aquaculture Development, and Roads and Highways, among others.

While Figure 4 shows only selected categories of public TVET institutions, the private sector is much bigger in the field of TVET, including not only privately run TVET institutions but also corporate on-the-job training and informal apprenticeship. In terms of the number of trainees, apprenticeship is the biggest category. Entry into an apprenticeship is easy because it doesn't require any formal certificate or minimum educational scores. Although it has been a common practice to pay initiation fees to the master to start an apprenticeship, their collection is not as strictly enforced as the collection of school fees, particularly when the prospective apprentices are from poor households or are the masters' relatives. Such a complicated picture of skills development indicates the varieties of paths that young people take after JHS, up to which access to formal education is almost universal.

Figure 4 Skills development system in Ghana



Source: Compiled by the author based on interviews and official documents.
Note: yr = year; ITTU = Intermediate Technology Transfer Units; GRATIS = Ghana Regional Appropriate Technology Industrial Service.

2.4 Ongoing TVET reforms in Ghana

In the past decade, globally, discussion about TVET has concentrated on the relevance of school education so that the transition from school to work will become smooth and graduates can apply their learned knowledge more effectively in their work. For that matter, it was considered important to reflect the voices of the private sector in decisions about educational contents (King and Palmer 2013). Based on neoliberal economic theory, international specialists argue that the primary role of government should be to bridge the gap between supply and demand of the trained workforce. Therefore, external advisors encourage governments to establish independent agencies to coordinate among training providers, industries that employ graduates of training institutions, and the various ministries involved. In other words, the role of government is envisaged as more of a catalyst than a direct training provider, with the private sector expected to drive the competitive training market (Eichhorst et al. 2012, 4–9; Yamada and Mazda 2009, 130–35).

In Africa, South Africa was the first to adopt TVET reform according to this framework, and Ghana is in the first group of sub-Saharan African countries that followed suit, with growing support from donor organizations (Allais 2007). As explained in section 1.1, the comprehensive reform of the formal and informal skills development system has been in progress under the initiative of COTVET (Boateng 2012; Ansah and Ernest 2013).

Major projects, aside from reforms in Ghana's TVET system, since earlier education reform in 1987 include the following:

- Support to private-sector development
- Ghana skills and technology development project
- Technical and vocational training voucher program
- National apprenticeship program
- Development of skills and industry project
- Ghana skills development initiative

Among the activities undertaken in these programs are the development of the 23 competency-based training operational manuals, training offered to 200 TVET instructors, Workplace Experience Learning development, and the development of the Trainee Entrepreneurship business model program (Ansah and Ernest 2013; Gondwe and Walenkamp 2011; UNESCO International Bureau of Education 2011).

Regardless of these massive reform efforts, there are still serious concerns about skills mismatches, particularly in the manufacturing and informal sectors, both of which are listed as priorities for the growth initiatives of the government of Ghana (Government of Ghana 2014a). To mitigate the gap, it is indispensable to grasp the nature of the skills gap more precisely so that the reform will be targeted at the necessary areas and yield expected results. With the aim of contributing to a better understanding of the realities, beginning with the next section, we will provide analyses of the skills of garment-sector workers—in both formal and informal sectors—and TVET trainees, with a focus on the differing compositions of skills.

3 The compositions of skills and their determinants

This section will investigate how different types of skills are related to each other and how these different skill sets influence performance at the actual workplace. Many researchers point out interrelationships among different skills, and they point out that some skills contribute to enhancing other skills. For example, Cunha and Heckman (2007) proposed a concept of "self-productivity" of skill, representing the dynamic process that different types of skills complement one another and improve overall capacity. The Organisation for Economic Co-operation and Development ([OECD] 2015) points out that cognitive skills and noncognitive skills are interrelated and enhance each other. Capacities for creativity, critical thinking, and problem solving are typically considered a mixture of cognitive and noncognitive skills.

Based on the understanding that a worker's overall performance is determined by the composition of interrelated skills, we will investigate in this section the characteristics of a worker's skills and the worker's performance in the garment industry in Ghana. By doing so, we will better understand the dynamics of skill formation and draw its policy implications for improved approaches to training and its provision.

3.1 Methodology and data

This analysis' major sources of data are the written and practical tests and questionnaires for TVET trainees, factory workers, and informal workers conducted in 2018 and 2019 (see Table 4). Since our module is composed of three assessment methods, as shown in Table 5, it enables us to capture the following four domains of skills: (1) cognitive skills, (2) practical skills, (3) noncognitive skills (behavioral skills), and (4) noncognitive skills (personality traits). As explained in the Purpose of the Research section, cognitive skills represent cognitive capacities to process information and reason, which have been considered the core contents of school education and whose acquisition has been assessed by written tests. In the SKY Project, there are four subjects in the written test: reading, mathematics, integration of reading and mathematical information processing, and vocational knowledge. The second category of skills listed above, practical skills, comprises vocational skills to be performed in the work setting. As explained above, the test on the possession of theoretical vocation-specific knowledge is included in the written test and constitutes a part of cognitive skills. The third category of skills,

noncognitive skills, is related to attitude, behavior, value system, and personality. Since noncognitive skills are difficult to measure quantitatively through written tests due to their subjective nature, we used the questionnaire to capture this category of skills. We have divided noncognitive skills into two categories—workplace behavior and personality—for detailed and reliable analysis. The former relates to skills that let the worker function well in the workplace by adopting his or her knowledge appropriately in practice, establishing appropriate interpersonal relations, following rules, and making decisions to achieve the required results. The latter relates to personality, for which we used an assessment scale that can capture a participant's personality according to eight traits, including the Big Five. The Big Five personality traits are an established psychological classification and are commonly used in taxonomy. The SKY Project adopts the eight-personality-traits scale used in the World Bank STEP Skills measurement survey. These eight traits include (1) extraversion, (2) conscientiousness, (3) openness to experience, (4) neuroticism, (5) agreeableness, (6) grit, (7) hostile attribution bias, and (8) decision making (Pierre et al. 2014).

Table 5 Four types of skills to be assessed in the Skills and Knowledge for Youth Project

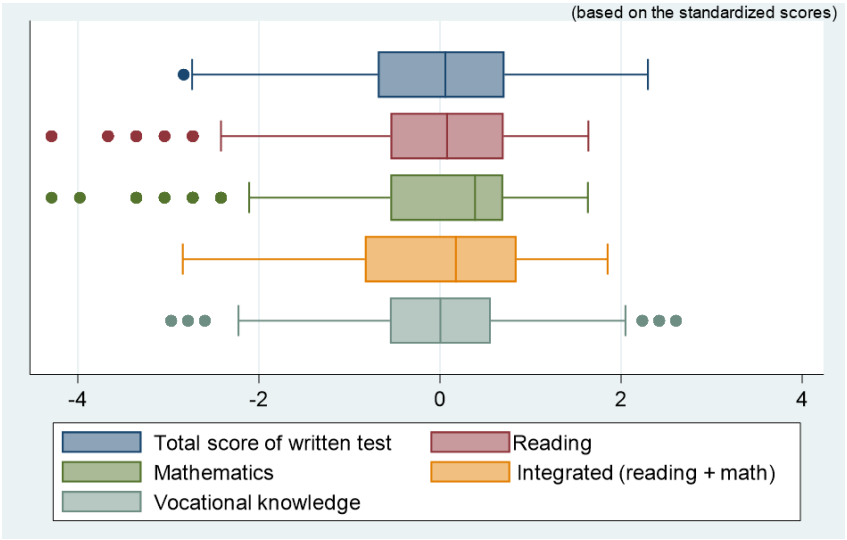
Number	Types of skills	Methods of assessment	Items used for assessment
1	Cognitive skills	Written test	Twenty items for each subject ➢ Reading ➢ Mathematics ➢ Integrated ➢ Vocational knowledge
2	Practical skills	Practical test	Four practical activities ➢ Pattern making ➢ Sewing ➢ Ironing ➢ Advanced (pocket making)
3	Noncognitive skills (behavioral)	Questionnaire	SKY's unique scale on workplace behavior
4	Noncognitive skills (personality traits)	Questionnaire	Psychological personality scale (8 personality traits)

Source: Skills and Knowledge for Youth Program assessment module.

3.2 The overall result of the written and practical tests

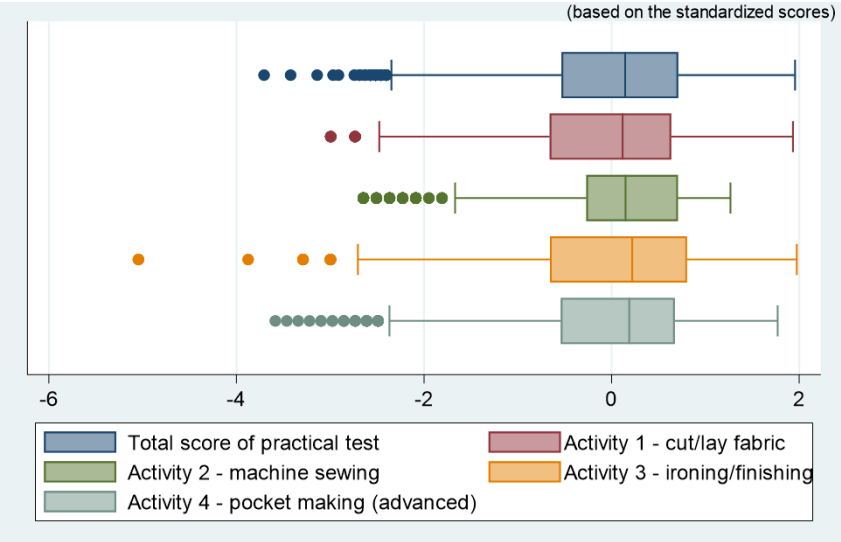
First, we would like to compare the results of the written test and the practical test. We demonstrate whether and how cognitive skills and practical skills are related to each other through this comparison. Figures 5 and 6 show the average and variance of participants' performance on the written and practical tests, respectively, and by domains of skills required. Figure 5 summarizes the results of the written test, which is classified according to four domains, namely, (1) reading, (2) mathematics, (3) integrated/information gathering, and (4) vocational knowledge. Figure 6 presents the outcomes of the practical test, which is composed of four activities, namely, (1) cutting/laying out the fabric, (2) machine sewing, (3) ironing and finishing, and (4) making a pocket. In both figures, the vertical lines within the boxes indicate the mean scores for the grand total and subtotals of specific parts of the test. The boxes' widths represent the distributions of scores among participants in the second and third quartiles, and the whiskers indicate the highest and lowest scores. The dots outside of the whiskers are outliers. In general, the narrower the box and the range of the whiskers, the more concentrated the participants' performances are around the average. On the other hand, when the box and whiskers are stretched horizontally, the more scattered are the participants' competency levels.

Figure 5 Average and variance of written test results



Source: Data from Skills and Knowledge for Youth Program assessment.

Figure 6 Average and variance of practical test results



Source: Data from Skills and Knowledge for Youth Program assessment.

Figure 5 shows that the average mathematics points are more toward the right side and that the score distribution is relatively smaller than the distribution of other subjects. The vocational knowledge box is smaller than those for other subjects, which means the score distribution is relatively small. This subject also was the most challenging, with the average score lowest among the four. On the other hand, mathematics was the easiest, and with a few exceptions, the score difference among the participants was smaller. The box for integrated skills is the widest, which means that high and low performers' variation was more significant than for other subjects. The integrated skills test requires the participants to combine mathematical and literacy skills to solve the problem. Therefore, the lower average and wider distribution of performances in this subject indicate that combining different types of knowledge and skills demands higher cognitive capacities than does answering simple and straightforward questions using mathematical and reading skills. As a result, the gap between the performers with higher analytical skills and those without such skills became wider.

As for the practical test shown in Figure 6, while the average scores do not differ so much across the total and subtotal scores for the four activities, the variance patterns are diverse. Both the boxes' and whiskers' widths show that the performance variance was the biggest in ironing/finishing. The performance variance is the smallest in machine sewing, and the whisker above the average score is short. This indicates that there were not many outstanding high performers, but the majority performed with relatively small differences. The fourth activity, pocket making, requires participants to combine the skills of analyzing the sample, cutting and

laying fabric, sewing, and ironing before and after sewing. In this sense, as was the case with the section on integrated skills in the written test, this activity demands both practical and technical capacities and cognitive processing. Regardless, this activity's score variance is not as significant as some other activities such as ironing/finishing. This small variance is explained by examiners' low expectations when few participants perform the task perfectly, which results in inflating the average scores.

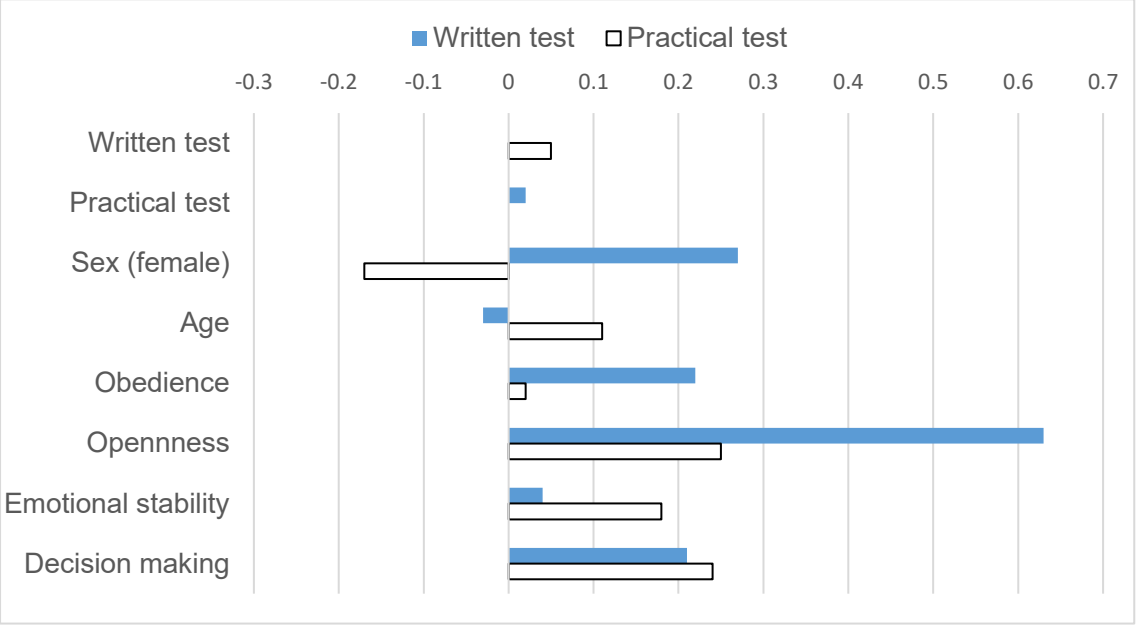
There are activities in which differences in the performance of those who do better and those who do not become obvious, while other activities do not show a clear difference. For example, sewing skills do not allow for the demonstration of a big difference among participants. Once participants use a sewing machine, there is not so much skill variance in this skill type. As this is the main activity for all participants, whether trainees in the TVET garment course, factory workers, or informal workers, participants are well exposed to this activity. As such, familiarity with the required tasks affected performance in other activities too. For example, some TVET trainees did not score high in ironing or folding the shirt because they did not learn it in school. Meanwhile, in the workplace, in either the informal or the formal sector, finishing products for sales is an important part of a worker's task. Because of differences in experience, the score variance in this activity was large. As mentioned earlier concerning the scores on the pocket-making activity, the examiners' perspectives would be the factor to influence the scores. In some activities, such as ironing/finishing, the score's variance was significant. The different scoring behavior among examiners also would explain such variation. Their judgment criteria for productive activities are influenced by their backgrounds and experiences and cannot be fully standardized. Though we are not going further with this issue of perception differences in this section, in Section 5, we will discuss the effect of differential perceptions on skills among stakeholders—employers, trainers, and workers.

3.3 The relationships among different types of skills

We used multiple instruments (questionnaire, practical test, and written test) to examine how different types of skills (presented in Table 5) relate to each other. In addition to the relationships among skills, we examined the effects of background factors, such as demographic, household, and educational factors, on performance on the written and practical tests. Figure 7 shows key items that significantly influenced test performance. The explanatory variables' coefficients were estimated with ordinary least squares regression modeling using

the test scores as the dependent variable. The blue bars indicate the impact of listed items on the written test results. The white bars demonstrate their impact on the practical test results. The longer the bar (the bigger the coefficients), the more significant the effect is. When the bar stretches to the left, the effect is negative, while those stretching to the right demonstrate positive impacts. The effect of sex is positive when more females perform higher. Meanwhile, it becomes negative when males outperform—in other words, being female affected the written test's performance positively. At the same time, it did not have a positive effect on the practical test.

Figure 7 Influential factors on written and practical test results



Note: Unit is coefficient of regression analysis.
Source: Data from Skills and Knowledge for Youth Program assessment.

There are several findings. In terms of demographic background, age, which is likely to be associated with years of experience, largely influences the practical test score. On the other hand, performance on the written test tended to be higher among younger participants. The length of experience betters one's practical skills, independent from one's cognitive skills, to put it differently.

It is notable that noncognitive skills contribute significantly to both the written and practical test results. The items openness and emotional stability are variables we constructed using the questionnaire items on personality traits. Obedience and decision making were created through the factor analysis of 27 questionnaire items regarding workplace behavior.

These socioemotional and personality factors are considered part of the participants' competencies, affecting overall workplace performance. As Figure 7 shows, the attitudinal tendency of being obedient to rules had a significant positive relationship with the written test result and somehow with that of the practical test. Among personality traits, openness, emotional stability, and decision making positively influence both practical and written tests, though the amount of influence varies.

While Figure 7 treated the test results at the aggregate level, for a more in-depth analysis of the relationships among skills, in Table 6, we examined correlations between four domains of the written test and overall performance on the practical test.

Table 6 Relationship between practical skills and cognitive skills, by subject

	Practical	Reading	Mathematics	Integrated	Vocational knowledge
Practical	—				
Reading	.19**	—			
Mathematics	–.01	.28	—		
Integrated	.23**	.50**	.30**	—	
Vocational knowledge	.30**	.39**	.19**	.55**	—

Source: Data from Skills and Knowledge for Youth Program assessment.
**Pairwise correlation is significant at the 5% level (two-tailed).

First, from the table, we can see that practical skills are correlated strongly with most cognitive abilities except for mathematics. Practical skills especially have a strong correlation with vocational knowledge (.30, $p < .05$), which indicates that theoretical understanding of textiles and garments contributes to better performance in practice. Second, vocational knowledge correlates with three other cognitive domains (.39 with reading, .19 with mathematics, and .55 with integrated skills, all at the 5% level of probability), which means that good theoretical understanding is developed on top of the essential capacities of reading, calculation, and information processing. The contribution of reading and integrated skills is more significant than calculation. This fact indicates that reasoning based on information corrected through reading is key for establishing advanced vocational capacities.

3.4 Comparison of scores among different affiliations

As discussed above, different types of skills interact. To be productive in the workplace, production skills with one's hands are not enough. Also required are cognitive capacities, such as reasoning and information processing, and noncognitive behavioral skills and personality, which engage the individual worker in working or collaborating with others. The analysis presented above demonstrates there are patterns in the relationships among those skills. Based on this understanding about the nature of skills, in this section, we would like to see whether there are differences in such patterns by affiliation: whether the person is a trainee at a TVET institution, is a worker in a formal-sector factory, or is a worker at a workshop in the informal sector.

Although there are variations within these groups, there are general characteristics classified by the participants' affiliations. Our assessment shows that informal-sector workers tend to have previous work experience before their current jobs, while for a large portion of formal-sector workers, the current job is the first job. Informal workers also tend to be relatively older and have fewer years of school-based education than those in the formal sector. Compared to workers in both the formal and the informal sectors, those still in school (both TVET and technical university trainees) tend to get better results on the written test but worse results on the practical test.

3.4.1 Cross-sectoral comparison of the results of the practical skills assessment

When we compare the practical test scores of TVET trainees and workers in the formal and informal sectors, the scores are higher among formal-sector workers and TVET trainees than informal-sector workers. Figure 8 presents the range of practical scores by affiliation. Similar to Figures 5 and 6, the horizontal lines within the boxes indicate the mean scores for, this time, the total score of the four activities on the practical test. The boxes' heights represent the distributions of scores among participants in the second and third quartiles, and the whiskers indicate the highest and lowest scores. There are 29 scoring items; for each, the examiners grade participants' performance between 1 and 5. Therefore, the theoretical maximum points a participant can earn is 145.

Figure 8 Results of the practical test, by affiliation

Source: Data from Skills and Knowledge for Youth Program assessment.

In terms of both the average and the highest score among participants, those who work in formal-sector factories performed best among the three groups, followed by TVET trainees and informal workers. Informal-sector workers are peculiar in terms of not only their low average scores but also the scores' wide variance, which stretches between less than 50 and around 130. This result indicates that some informal-sector workers could barely perform basic cutting and sewing work satisfactorily, while others were as good as participants in other groups. However, we should note that such a difference in practical test scores seems to be explained, at least partially, by the big gap in opportunities to operate industrial sewing machines. Some TVET trainees and informal workers are familiar with conventional sewing machines that are handled manually. In contrast, formal factory workers, other trainees, and informal-sector workers had experience handling industrial electric sewing machines. During the actual test, participants were allowed to use the machines they were familiar with, and whether they used manual or electric machines did not affect their scores. Regardless, the significant disparity in practical scores between informal-sector workers and the other two groups greatly owes to low performance in sewing. Given this fact, one can assume that the gap in sewing skills is caused by the techniques that affect sewn products' quality, although such techniques are likely to be held by those who are familiar with electric machines and who work in the formal sector. It also would relate to the quality standard required for commercial

mass production in the formal sector for which the workers are trained. Unlike these factory-based workers, the informal-sector workers are used to work with individual customers and unstandardized orders from them.

Figure 9 shows a breakdown of the participants' scores by four activities required in the practical test to understand further the skills structure for effective vocational practices.

Figure 9 Results of the practical test, by affiliation and activity

Source: Data from Skills and Knowledge for Youth Program assessment.
Note: TVET = Technical and Vocational Education and Training.

In general, there is no significant difference between the three categories of affiliations in terms of average scores and intragroup variance except that the variance was a little larger in the group of formal-sector workers and the average score was a little lower in the group of informal-sector workers. However, in two activities, namely, sewing and pocket making, we see significant intergroup differences. For the informal-sector workers, wide intragroup variances with longer tails toward the lower scores are apparent in these activities. As discussed earlier, the informal-sector workers have less experience sewing many products with

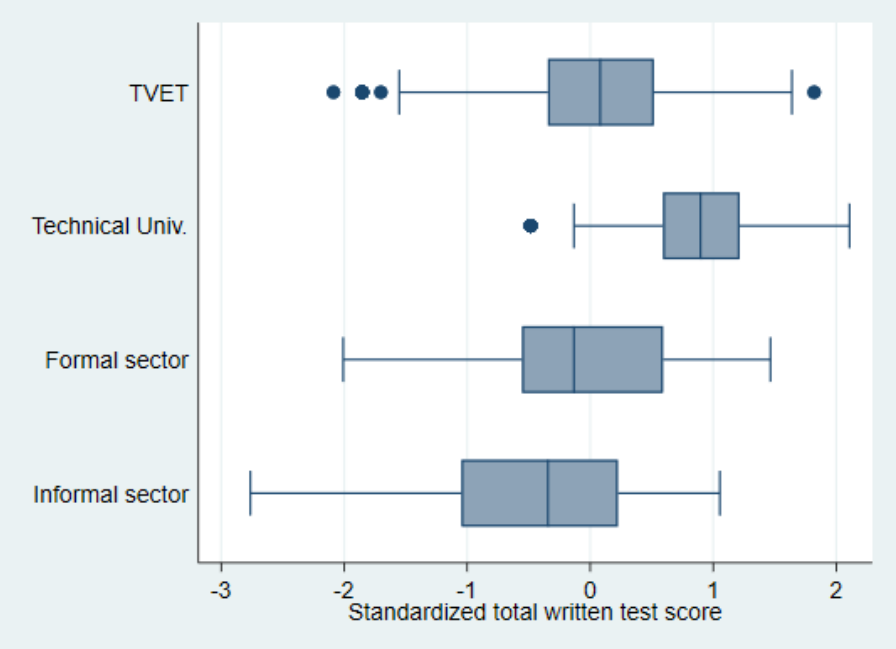
standardized quality. Also, the scattered results in the activity of pocket making, which requires combining multiple techniques and analyzing the sample, indicate that the capacities of comprehensive problem solving vary among workers in the informal sector more than in the formal sector and TVET.

Regarding the scores for the cutting/laying fabric activity, the intragroup distribution patterns were similar among the three groups. As for ironing/finishing skills, factory workers' average scores are slightly higher than the other two groups' scores. At the same time, the intragroup variances are smaller for this activity in all three groups than for other activities.

3.4.2 Cross-sectoral comparison of the results of the written test

Figure 10 shows the standardized scores on the written test by affiliation. In this figure, the average scores for the respective groups are plotted. The overall mean of the test scores is made to be zero. Therefore, when the mean for the group is lower than zero, that group's performance is less competitive, while a mean higher than zero indicates the opposite. The average score on the written test is pushed up by the trainees at the technical university who took part in the assessment. Putting that aside, the mean scores for TVET trainees and formal-sector workers are not too different. Although there was no significant gap in their average performances, the informal-sector workers' group demonstrated wider variance and lower means than TVET trainees and formal-sector employees. In general, the performance of informal-sector workers was lower on both the written and the practical tests. However, there is a great deal of diversity within this category (e.g., age, education, and experience). The results show that the current assessment is more relevant and easier to perform for formal-sector workers and school-based trainees. In contrast, the informal-sector workers' daily tasks may differ in nature, as their customers are predominantly individuals who request tailoring with unique designs. To grasp the effective skills in their work contexts, one also would need to review the assessment design itself.

Figure 10 Standardized written test score, by affiliation



Source: Data from Skills and Knowledge for Youth Program assessment.
TVET = Technical and Vocational Education and Training; Univ. = university.

3.5 Summary and discussion for policy implications

We would like to summarize the key findings of this section regarding the complex nature of skills and discuss what kind of skills development intervention is needed.

First, we found that practical skills are strongly correlated with the level of cognitive skills (reading, mathematics, integrated, vocational knowledge). Among the four domains of cognitive skills, basic reading and reasoning based on the integration of mathematical and reading skills contribute greatly to both practical skills and a higher level of theoretical understanding about garment production. This indicates that collecting and processing information correctly from figures, graphs, and relatively longer sentences may help trainees acquire more vocational knowledge. It suggests the importance of theoretical study at TVET colleges, while the contents should be carefully selected to be relevant to the practical requirements in the actual workplace to strengthen their synergy.

Second, the result indicates that socioemotional skills (workplace behavior) and personality traits are significant determinants of performance on both the practical and the written tests. This outcome hints that the government's and employers' skills development programs need to pay close attention to these noncognitive dimensions of skills to improve workers' and TVET trainees' productivity. The attitudinal tendency of being obedient to rules had a significant positive relationship with the written test result and somehow with that of the practical test. Among personality traits, openness, emotional stability, and decision making positively influence both the practical and the written tests, although the amount of influence varies.

Third, participants from the informal sector underperformed those from the formal sector on both the written and the practical tests. We also identified a significant intragroup variance among the informal-sector workers. This result highlights the importance of providing more opportunities for informal-sector workers' skills development for overall upgrading and for equalizing the quality of work among them. Considering that 86% of industrial workers in this country are in the informal sector, policy intervention for informal workers' skill development is necessary for industrial development. At the same time, there is a possibility that the skills demanded in our assessment were more relevant to formal-sector workers than to those in the informal sector, which disadvantaged those who are not working in formal factories. In the informal sector, the nature of work is comprehensive, which stretches from customer service to design, sew, and finish. Usually, the tasks that workers in the informal sector are dealing with are less standardized than those in the formal sector. Based on this consideration, the informal sector's training contents should be more task oriented than curriculum oriented.

4 Gaps in the perceived importance of skills

In Section 3, we examined the skills of workers and TVET trainees and untangled the complex relationships among different types of skills. Based on that, in this section, we will turn to people's ideas by comparing the perceptions of necessary skills of different stakeholders. The SKY Project's questionnaire is designed to capture the gaps in perceived levels of importance of essential skills in workplaces. While most existing studies have focused on supply-demand mismatches at the system level (e.g., the number of graduates and labor market situation), the SKY Project tries to untangle the mechanism of how differential expectations of skills cause the mismatches. There are several dimensions at which perception gaps can occur; they are the following:

- ✓ Perception of TVET trainers versus expectation of employers
- ✓ Perception of TVET trainers versus perception of TVET trainees
- ✓ Expectation of factories' production managers versus perception of workers
- ✓ Expectation of factories' production managers versus perception of TVET trainees

To investigate the nature of mismatches closely, we gave questionnaires to TVET trainers, production managers at the factories, and TVET trainees. We asked what skills they perceive to be necessary, aiming to identify the areas where expectation differences exist. We also gave the questionnaire to factory workers in which we asked whether they consider themselves capable of those skills, aiming to identify areas where expectation differences exist.

4.1 Methodology and data

In the questionnaires given to the above-mentioned stakeholders, we asked for their perceptions about the degree of importance of 30 general skills and 40 task-specific skills in the garment industry.

Table 7 shows the details about 30 general skills and 40 garment-related skills on which this study has focused. Thirty general skills are divided further into two types of skills, namely, cognitive and behavioral skills. Cognitive skills include speaking, listening, reading, and writing in both English and the local language as well as numeracy. Behavioral skills cover the

following areas: accuracy of work, subordination, attention to workplace environment, self-regulation, interpersonal skills, and business management skills. Forty garment-production skills are composed of the following eight domains: (1) designing, (2) understanding garment structure, (3) pattern making, (4) sewing, (5) finishing, (6) business management, (7) quality control, and (8) machine operation.

Table 7 Skills used in the questionnaire

	Component	Detailed items
30 general skills	9 cognitive skills	Speaking, listening, reading, and writing (in both English and the local language) Numeracy
	21 behavioral skills	Accuracy of work, subordination, attention to workplace environment, self-regulation, interpersonal skills, business management skills
40 garment skills	8 domains	Designing, understanding garment structure, pattern making, sewing, finishing, business management, quality control, machine operation (5 items for each domain)

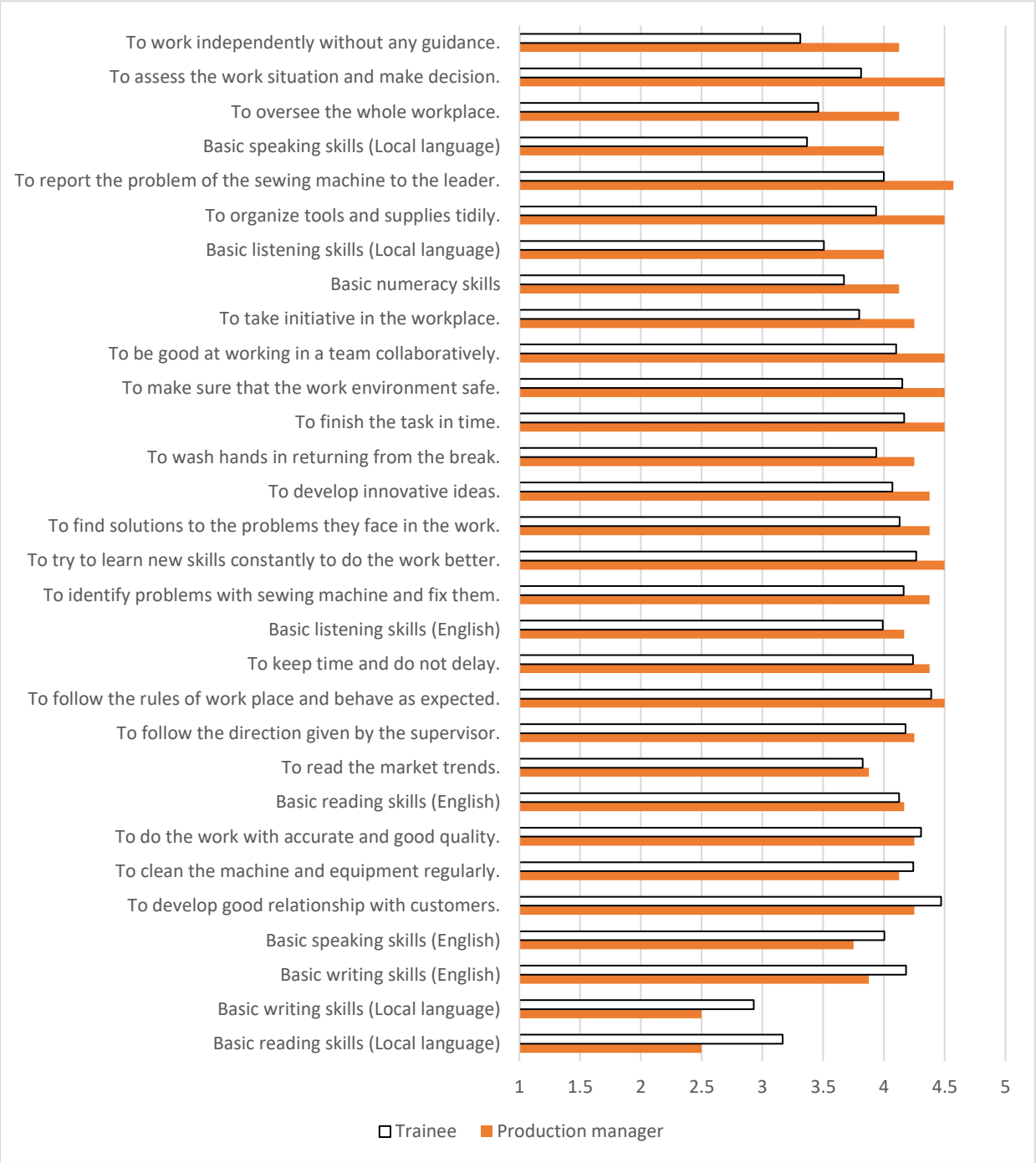
4.2 Perception gap on general skills

First, we compared the perceived importance of 30 general skills between production managers and TVET trainees (see Figure 11). We made this comparison because the trainees are considered future workers while the managers currently employ and supervise workers in the garment industry. Therefore, by comparing these two groups of stakeholders, we can see the gap of perceptions between job seekers and employers.

For all listed skills, we required respondents to rate the level of importance between 5 (the maximum) and 1 (the minimum). In Figure 11, the scores indicate the average points of all respondents in their respective groups. Skills are listed in descending order from greater to smaller gaps between production managers and trainees. Skills at the top are those on which

trainees do not place as much importance as do production managers. Skills at the bottom of the list, on the other hand, are those that production managers do not regard as necessary as much as trainees do.

Figure 11 Gap between trainees' and production managers' perceived importance of general skills



Source: Data from Skills and Knowledge for Youth Program assessment.
Note: Unit is mean by respondents' group.

The skills at the top are “to work independently without any guidance,” “to assess the work situation and make decision,” and “to oversee the whole workplace,” all of which are competencies related to the attitude of workers who can work autonomously and independently. The result shows that production managers expect such an attitude from individual workers more than trainees assume. On the other hand, as we see in Figure 11, production managers also emphasize an attitude of following the organizational rules and collaborating in a team. This indicates that, according to the perception of production managers, being autonomous, cooperative, and obedient to the rules is a set of attitudes that do not conflict but support each other.

The other area where a large perception gap exists relates to cognitive skills. Toward the bottom of Figure 11, some cognitive skills such as reading and writing in English and the local language are listed, showing that cognitive skills are not valued as highly by production managers as trainees think. It is interesting to note that, on the other hand, speaking and listening skills in the local language are much more important to production managers than trainees think. We can speculate that in an environment where not all workers are fluent in English or capable of reading and writing, communicating in the local language is more critical. Production managers also value basic numeracy skills. This is probably because these skills are essential to carrying out tasks accurately in the actual workplace.

While Figure 11 highlights types of skills according to the size of the gap in perceived importance, now we turn to the skills demanded highly by production managers. Table 8 shows the top eight skills that production managers expect workers to be equipped with (the table presents only skills with an average score of 4.5 or higher).

Table 8 General skills that production managers regard as important

Number	General skill	(1) Score by managers	(2) Score by trainees	(3) Gap between (1) and (2)
1	To report the problem of the sewing machine to the leader.	4.57	4.00	0.57★
2	To organize tools and supplies tidily.	4.50	3.93	0.56★
3	To finish the task in time.	4.50	4.10	0.33
4	To try to learn new skills constantly to do the work better.	4.50	4.26	0.23
5	To make sure that the work environment [is] safe.	4.50	4.15	0.34

6	To assess the work situation and make a decision.	4.50	3.81	0.68★
7	To be good at working in a team collaboratively.	4.50	4.09	0.40
8	To follow the rules of the workplace and behave as expected.	4.50	4.30	0.11
Average score among 30 general skills		4.14	3.93	0.21

Source: Data from Skills and Knowledge for Youth Program assessment.

Note: Unit is mean by respondents' group. A star (★) indicates a skill for which the mean difference between production managers' and trainees' importance scores is more than 0.5.

The top skill that production managers regard as necessary is "to report the problem of sewing machines," followed by seven other skills related to the relationship with management, safety, regulation, and teamwork. The common characteristic across these skills is the nature of interpersonal skills. It indicates that production managers want factory workers to adapt themselves well to the industrial-organizational culture. It is worth noting that, on the other hand, skills that emphasize personal ability to learn and make decisions are also highly regarded by production managers (such as numbers 4 and 6). Based on these findings, one can conclude as follows: While production managers want workers to be equipped with adaptive attitudes toward the organization, they also value the autonomy of workers, which allows them to assess situations and make appropriate decisions by themselves, in addition to completing assigned tasks. A star (★) in Table 8 indicates a skill for which the mean difference between production managers' and trainees' importance scores is more than 0.5. In particular, the item "to assess the work situation and make a decision" (number 6) showed a significant difference in recognition (0.68), indicating a lack of awareness among trainees of the fact that the ability to make decisions and take action in ever-changing situations is required in the workplace.

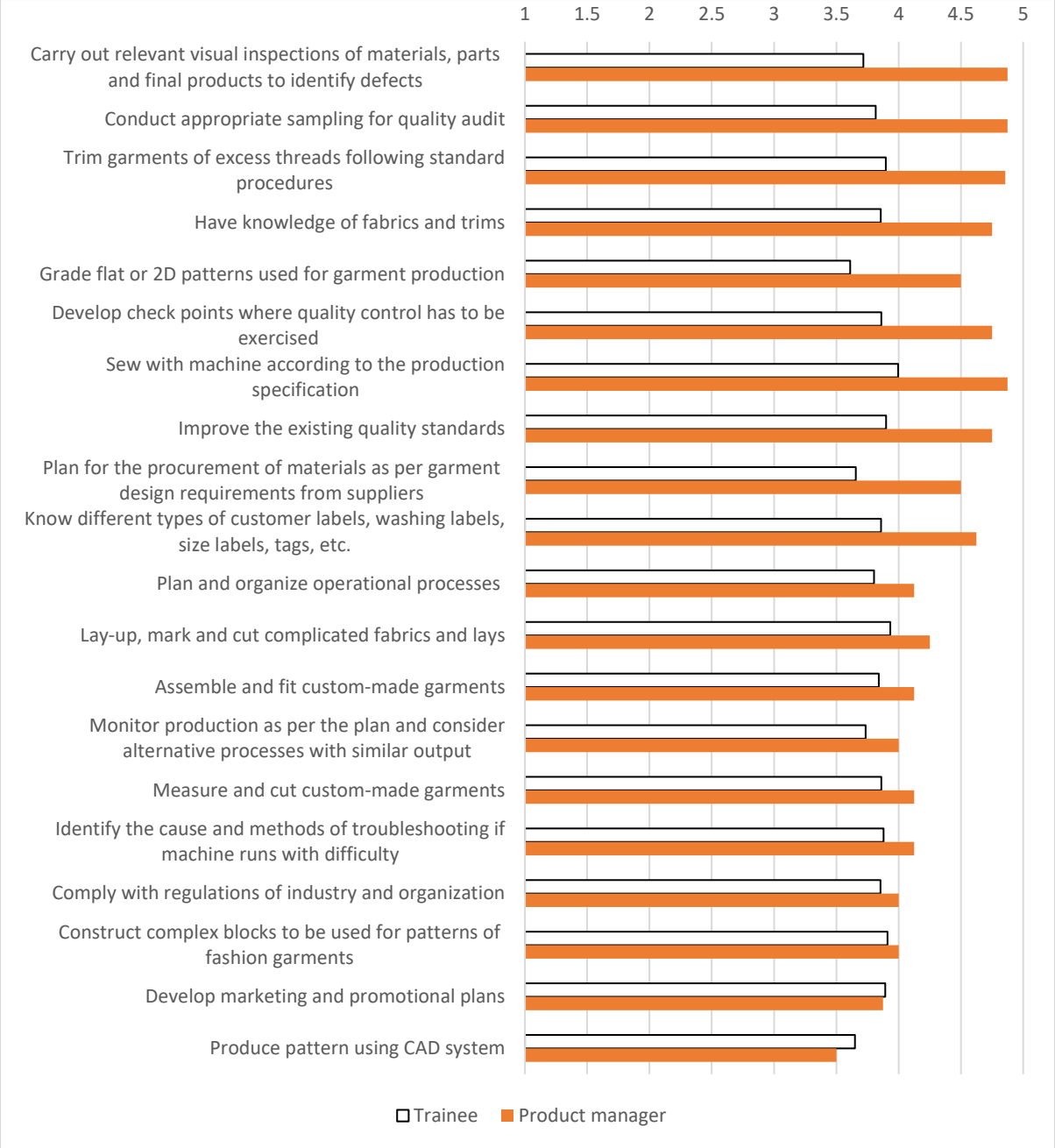
Although the data are not included in the table, we asked TVET trainers the same question about the importance of skills. The results show that production managers' and trainers' views of the importance of skills do not always converge. The trainers agree with the production managers about the importance of an autonomous attitude such as "to finish the task in time," "to try to learn new skills constantly," and "to develop innovative ideas." On the other hand, adaptivity to the organization such as "to report the problem of the sewing machine to the leader" and "to be good at working in a team collaboratively" seem to be disregarded by TVET trainers when compared to production managers' view.

4.3 Perception gaps on garment-production skills

In the previous section, we investigated the perception gap about cognitive and behavioral skills. In this section, we would like to see the perception gap focusing on 40 skills directly related to garment-production tasks.

Figure 12, similar to Figure 11, shows the areas where TVET trainees' and production managers' perception gaps exist. The upper part of the figure shows the skills that production managers highly emphasize, while trainees do not pay much attention. In contrast, the skills that appear at the bottom are the ones to which production managers do not attach much importance. Twenty items (10 from the top and 10 from the bottom) out of 40 items are presented to avoid information overload.

Figure 12 Perceived importance of garment skills by employers and technical and vocational education and training trainees



Source: Data from Skills and Knowledge for Youth Program assessment.
Note: Unit is mean by respondents' group. CAD = computer-aided design.

As shown in the figure, the trainees' score is generally moderate and similar across different skills. This suggests that trainees do not clearly distinguish between important skills and unimportant skills among all garment-related skills.

Since the scores given by trainees are generally low, the skills with smaller gaps are those production managers do not place much importance on, rather than those that trainees rate highly. The bottom 10 skills include, for example, the ability to use specific techniques

such as computer-aided design systems, the ability to develop marketing strategies, and machine troubleshooting. In the factory, the tasks are highly divided, and production managers may not expect workers to do the specific tasks that require specialized training. For example, maintenance of machine operation will be done by a mechanic specialist in the factory rather than ordinary line workers.

On the other hand, the items with the most significant gaps are those that production managers value more. The first 10 items in Figure 12 include all seven items that production managers regard as most important, as shown in Table 9.

Table 9 Garment-related skills that production managers regard as important

Number	General skill	(1) Score by production managers	(2) Score by trainees	(3) Gap between (1) and (2)
1	Sew with machine according to the production specification	4.88	4.00	0.88
2	Carry out relevant visual inspections of materials, parts and final products to identify defects	4.88	3.72	1.16★
3	Conduct appropriate sampling for quality audit	4.88	3.82	1.06★
4	Trim garments of excess threads following standard procedures	4.86	3.90	0.96
5	Have knowledge of fabrics and trims	4.75	3.86	0.89
6	Develop check points where quality control has to be exercised	4.75	3.86	0.89
7	Improve the existing quality standards	4.75	3.90	0.85
Average score among 40 garment skills		4.40	3.83	0.57

Source: Data from Skills and Knowledge for Youth Program assessment.

Note: Unit is mean by respondents' group. A star (★) indicates a skill for which the mean difference between production managers' and trainees' importance scores is more than 1.0.

Seven garment-related skills are listed in Table 9. These skills are rated 4.7 or higher by production managers, meaning they are regarded as essential for garment production.

The top three skills that production managers regard as significant are (1) "Sew with machine according to the product specification," (2) "Carry out relevant visual inspections of materials, parts and final products to identify defects of the garment," and (3) "Conduct appropriate sampling for quality audit," followed by four skills related to sewing, designing, and quality control. Four skills (numbers 2, 3, 6, and 7) out of seven skills are related to quality control, which indicates that this area of skills is regarded as highly important by

production managers. A star (★) in Table 9 indicates a skill for which the mean difference between production managers' and trainees' importance scores is more than 1.0. Again, we can see major perception gaps in skills related to quality control.

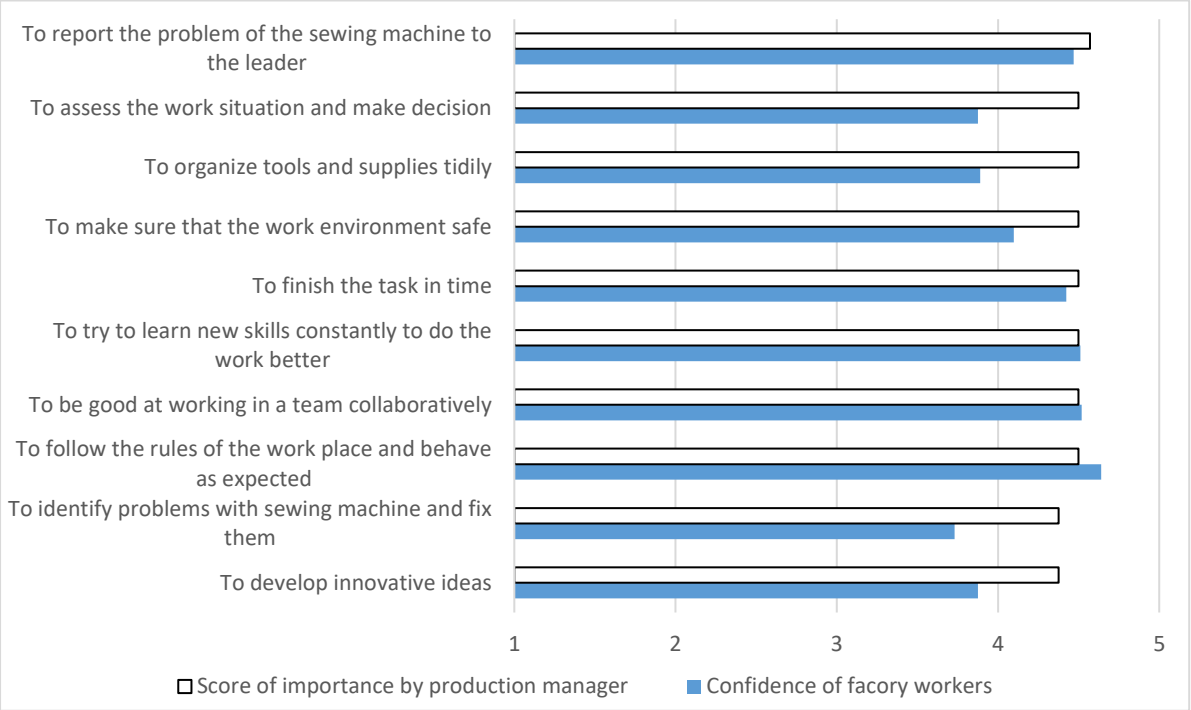
Though the data from TVET trainers are not presented here, we discovered that even trainers do not necessarily emphasize quality control. Instead, they tend to value skills related to designing, such as knowledge of fabrics and trims, measurement, and drawing sketch. Based on these findings, we suggest that increasing the training related to quality control in TVET training may help to enhance the relevance of graduates' skills for workplace demands.

4.4 How confident are workers in their essential skills?

So far, we have looked at the gap between the skills demanded by production managers and the skills valued by TVET trainees. Based on the results, we have explored how the supply-demand gap between employers and trainees entering the labor market can be explained from the perception level.

Now we turn our attention to workers who already have jobs. How well do they think they use the skills we have mentioned? Figure 13 shows factory workers' level of confidence in the 10 general skills that production managers consider essential. Workers were asked to rate the degree to which they thought they were competent in each skill on a scale from 1 (*could not do well*) to 5 (*excellent*). The results show that most workers feel that they have good skills at adapting to the workplace, such as reporting to their superiors and keeping time and rules. On the other hand, workers are less confident about soft skills related to autonomous behavior, such as assessing the situation, making decisions, and solving problems.

Figure 13 Confidence of factory workers in essential general skills



Source: Data from Skills and Knowledge for Youth Program assessment.
Note: Unit is mean by respondents' group.

Figure 14, as Figure 13 did, shows the degree of workers' confidence in the 10 garment-related skills that production managers emphasize. The results show that workers are not confident in their skills related to quality control such as "carry out visual inspections to identify defects," "conduct appropriate sampling for quality audit," and "develop checkpoint for quality control." This tendency coincides with that of TVET trainees, who do not place much importance on quality control skills. Production managers probably have felt the challenge in this area and, due to such awareness, scored highly the importance of these skills.

Figure 14 Confidence of factory workers in essential garment-related skills

Source: Data from Skills and Knowledge for Youth Program assessment.
Note: Unit is mean by respondents' group.

"Have knowledge of fabrics and trims" was found to be a skill about which workers did not have much confidence. Although the recent TVET education reform emphasizes practical skills more than theoretical knowledge, there is some theoretical knowledge with which managers expect workers to be equipped. Considering that there will be fewer opportunities to learn theories once they start working, it will continue to be an important role of the training sector to strengthen workers' knowledge.

4.5 Summary and discussion for policy implications

In this section, we presented the perception gaps in several layers involving different stakeholder groups: production managers, workers in factories, TVET trainers, and trainees. We also captured the skills from various dimensions. We used 30 general skills (composed of 9 cognitive skills and 21 behavioral skills) and 40 garment-related skills. We matched the perceived importance score to each skill by different groups, and we let workers self-evaluate their use of those skills.

We want to highlight two key findings of the study and its policy implications. First, there are apparent differences between production managers and TVET trainees in terms of the perceived importance of general skills. While production managers require workers to think by themselves, assess situations, and take initiative for improvement and problem solving, trainees are not aware of the importance of such competencies. Trainers also are not aware of the necessity to let trainees attain such attitudes to succeed in the job market. To cultivate both autonomous attitudes and adaptivity to the workplace among trainees, trainers need to understand the attitudes and soft skills employers expect from workers and then promote trainees' awareness.

Second, in terms of garment-related skills, one of the main findings was that production managers' focus was on quality control. Quality control was also the area where the perception of importance diverged the most between TVET trainees and production managers. In addition, the self-evaluation of workers' skills showed that many workers are not very confident in this area. These findings suggest that many of the challenges in the workplace lie in this area. Focusing on training for capacity building for quality control in training institutions may significantly improve factories' productivity and quality.

5 Comparative analysis of formal- and informal-sector workers: Practical and noncognitive skills and their impact on wages

This section presents a comparative analysis of factory workers and informal-sector workers, focusing on skills. We mainly focus on practical skills and noncognitive skills as the determinants of income differences. Though noncognitive skills involve both behavioral skills and personality traits (see Table 5), in this section, we will focus on personality traits. First, we present the wage gap between the formal and informal sectors and the result of the analysis, indicating the effect of skills on the wage difference. In the latter part of this section, we look at workers' self-evaluations of their practical skills reported in response to the questionnaire. We compare them with the scores on the practical test rated by assessors to see how the meta-cognition of one's own skill relates to actual practical skills.

5.1 Methodology and data

The data we use in this section are the scores on the practical test and the results of the questionnaire (particularly background information including the amount of wages, personality traits, and respondents' self-evaluation of skills).

During the practical test, we asked workers to execute the cutting, sewing, finishing, and advanced tasks while being evaluated by factory managers and TVET trainers. This experiment is crucial as it helps us assess the gaps between what workers think they can do and what they actually can do. Due to information asymmetry in developing countries, we might find a big gap between what skills workers perceive they have and their actual skills as evaluated by formal tests. On the questionnaire, the same workers were asked to self-evaluate their garment-production skills by answering 40 garment-related items (shown in Table 7).[1]

The descriptive statistics of the data used in this study are shown in Table 10. The results for the formal sector are on the left, and those for the informal sector are on the right. First of all, in terms of working conditions, formal-sector workers work fewer hours per day and fewer

[1] We made it clear to the participants that the results of the assessment and questionnaire would not be used for evaluations for career promotions or wage increases, so we would expect that workers self-evaluated themselves without exaggeration but with less motivation.

days per week than informal-sector respondents, even though they earn higher salaries on average. The average age is lower for formal workers, with many in their late 20s. Gender is predominantly female, but the percentage of males is slightly higher than that in the informal sector. In terms of knowledge and skills, such as those assessed on practical and written tests, the results are higher for formal-sector workers than for informal-sector workers.

Table 10 Basic data

Variable	Formal		Informal	
	Mean	Standard deviation	Mean	Standard deviation
Sample size (*n*)	62		92	
Wage (log)	6.12	0.28	5.77	1.03
Woman (male = 1, female = 2)	1.74	0.44	1.94	0.24
Age	29.50	8.15	36.89	9.00
Working hours per day	8.30	0.73	8.81	2.29
Working days per week	5.04	0.27	5.22	0.42
Practical test score	109.87	10.57	94.00	15.54
Written test score	51.78	11.52	46.77	11.73
Lower self-evaluation（*n*）	27		5	
Matched self-evaluation（*n*）	23		42	
Higher self-evaluation（*n*）	8		18	

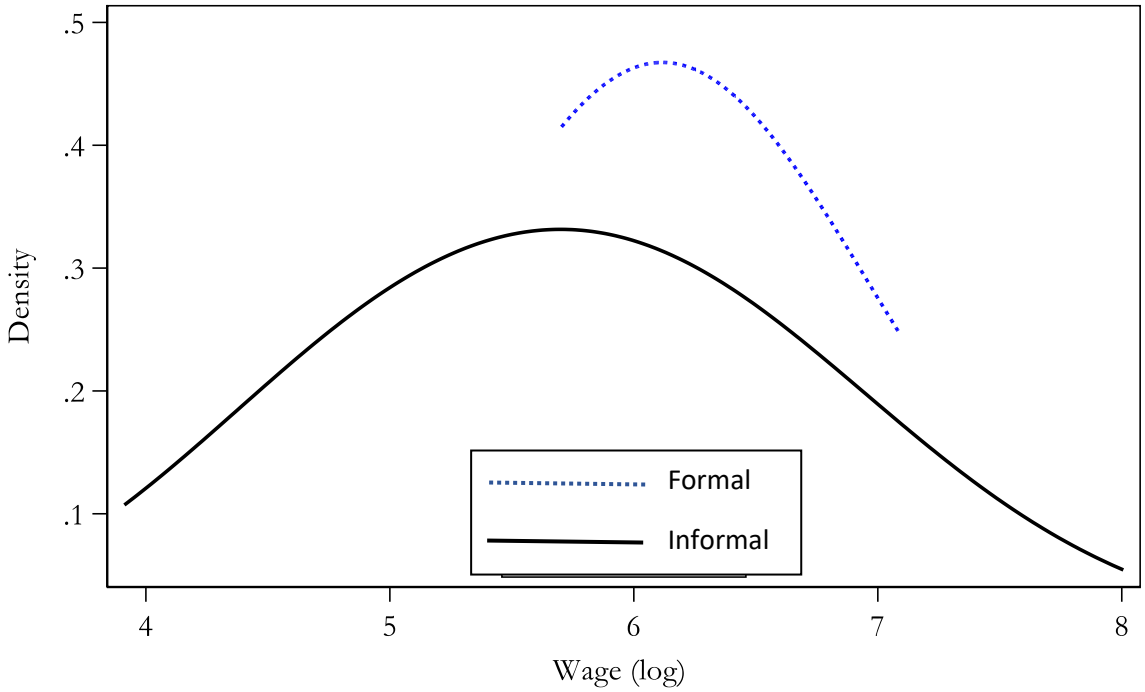
Source: Data from Skills and Knowledge for Youth Program assessment.

This section focuses on the degree of agreement between the practical test score (evaluation by another person) and the self-evaluation. The bottom three rows of the table show the classification of participants by level of self-confidence. Specifically, if the difference between the actual test and the self-assessment was within an average of ±0.5 points per question, it was classified as matched. If the self-assessment was 0.5 points or higher than the actual test, it was classified as higher; if the self-assessment was 0.5 points or lower than the test score, it was classified as lower. As can be seen from the results in Table 10, overall, formal-sector workers tended to rate themselves lower than others, while informal-sector workers tended to rate themselves higher than others.

5.2 What contributes to wage?

First, we would like to present the result that shows which factors determine the wage gap. Figure 15 shows the wage distribution of the formal and informal sectors. “Density” stands for the proportion among the total population (.1 means 10%, .2 means 20%, and so on). “Wage (log)” is logarithm of the amount of the wage of an individual worker in U.S. dollars. As can be seen, there is a clear distinction between the two groups. Formal-sector wages are higher and have less internal variance, while informal workers’ wages vary greatly, meaning that the amount of wage highly depends on the individual.

Figure 15 Wage distribution in the formal and informal sectors



Source: Data from Skills and Knowledge for Youth Program assessment.

To look for an explanation for wage differences, we investigated skills closely. Table 11 shows the results of our analysis of the factors contributing to wages. We found that skills explain wage differences and that this tendency cuts across the formal and informal sectors regardless of significant differences in work conditions. Garment-production skills and personality traits were included as explanatory variables, together with other demographic, education-related, and job-related traits. The results estimated in column (1) show the wage gap between formal- and informal-sector workers, which also is presented in Figure 15. The

results in column (2) show that age (which indicates a difference in experience) and education also explain the wage gap but to a smaller extent. The results in columns (3) and (4) show that whether a worker is in the formal sector doesn't explain wage differences if the garment-related skills and personality traits are involved as the variables. This means that garment-related and noncognitive skills explain a large part of the wage gap between the formal and informal sectors.

Table 11 Factors' influence on wages

	(1)	(2)	(3)	(4)
Formal sector	0.401***	0.300***	0.051	0.064
	(0.120)	(0.180)	(0.220)	(0.218)
Male		0.074	–0.026	–0.005
		(0.114)	(0.121)	(0.140)
Age (log)		0.706***	0.809***	0.762***
		(0.205)	(0.229)	(0.237)
Learned garment at school		0.236***	0.081	0.036
		(0.112)	(0.124)	(0.118)
Dummy of first job		–0.208	–0.190	–0.157
		(0.151)	(0.145)	(0.143)
Education		0.082***	0.106***	0.082*
		(0.038)	(0.036)	(0.082)
Control for garment skills	No	No	Yes	No
Control for personality traits	No	No	No	Yes

Source: Data from Skills and Knowledge for Youth Program assessment.
Note: Robust standard errors are in parentheses.
*$p < .1$. ***$p < .01$.

Table 12 shows how practical skills and personality traits differ between the higher- and lower-wage groups, in both the formal and the informal sectors. The table's left side shows the formal-sector results, and the right side shows the informal-sector results. Workers in each sector were divided into higher- and lower-wage groups, with even numbers in each group. In general, formal-sector workers are superior in all practical skills than are informal-sector workers. However, when the practical skills are examined in detail, the picture is mixed. The skills of pattern making and ironing do not differ much between the wage groups, while sewing and advanced activity do (since advanced activity requires sewing skills, differences in sewing

also were likely to be reflected here). As confirmed in the previous section, differences in practical skills greatly affect the wage gap, but most of the differences are likely due to differences in sewing skills. Interesting to note, this result is the same for the informal and the formal sectors.

Table 12 Differences in practical skills and personality traits between formal and informal sectors

Variable	Formal				Informal			
	Lower wage		Higher wage		Lower wage		Higher wage	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Practical								
Pattern making	17.3	4.2	17.9	4.2	16.2	3.8	16.8	4.1
Sewing	25.7	7.2	28.8	4.3	17.8	9.5	21.5	8.4
Ironing	24.0	3.2	24.0	3.2	22.4	3.7	22.6	3.3
Advanced activity (making a pocket)	40.0	9.3	43.6	6.0	32.0	10.1	36.6	8.8
Total score of practical test	107.0	19.5	114.1	13.6	87.9	20.8	97.2	19.2
Personality								
Extraversion	3.3	0.8	3.3	0.6	2.8	0.8	3.3	0.6
Conscientiousness	4.1	0.7	4.5	0.4	4.1	0.7	4.0	0.7
Openness	4.3	0.5	4.6	0.5	4.2	0.6	4.2	0.6
Stability	2.6	0.9	2.9	0.7	2.9	0.8	3.1	0.7
Agreeableness	4.1	0.7	4.3	0.6	4.2	0.6	4.2	0.7
Grit	3.7	0.7	3.8	0.7	3.6	0.8	3.7	0.8
Decision making	4.0	0.8	4.7	0.5	4.0	0.6	4.2	0.7
Hostile attribution bias	3.1	0.9	2.9	1.0	3.1	1.0	2.9	1.0

Source: Data from Skills and Knowledge for Youth Program assessment.

Among the eight personality traits we adopted—(1) extraversion, (2) conscientiousness, (3) openness to experience, (4) neuroticism, (5) agreeableness, (6) grit, (7) hostile attribution bias, and (8) decision making—some personality traits scored differently in the two groups with different wages, and some did not. For extraversion, there was no difference between the two wage groups in the formal sector, while there was a gap of 0.5 points in the informal sector. Conscientiousness and openness differed between wage groups in the formal sector but not in the informal sector. In the informal sector, extraversion may help workers to connect with customers and to obtain good opportunities and information from peers, while

conscientiousness and openness may be required for formal-sector workers to build effective relationships in the organization. For decision making, the higher-wage group scored higher in both sectors, especially in the formal sector, where the difference was as much as 0.7 points. Interesting to note, hostile attribution bias was lower for the higher-wage group in both sectors.

5.3 Relationship between practical skills and self-esteem

The previous section suggested that both practical skills and personality traits contribute to wage differences. However, the relationship between practical skills and personality traits is still unclear from the analysis. To clue into this relationship, we decided to investigate the following question: How well do workers know their own abilities?

Table 13 shows the regression analysis results with the score on the practical test as the dependent variable. Models 1 through 3 show the results for formal-sector workers, and models 4 through 6 show those for informal-sector workers. Different variables are used in each model.

Table 13 Self-evaluation and practical skills

Dependent variable: Practical test score	Formal			Informal		
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Lower self-evaluation	0.070	0.062	0.070	0.019	0.034	0.022
	(0.050)	(0.051)	(0.047)	(0.064)	(0.067)	(0.066)
Higher self-evaluation	–0.040	–0.046	–0.061	0.190***	0.170***	0.175***
	(0.050)	(0.053)	(0.047)	(0.041)	(0.046)	(0.050)
Sex (1 = male, 2 = female)	0.029	0.023	0.015	–0.024	–0.027	–0.063
	(0.041)	(0.041)	(0.047)	(0.069)	(0.083)	(0.111)
Age	0.004*	0.005*	0.005*	–0.001	–0.001	–0.001
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Average working hours per day			0.060*			–0.003
			(0.031)			(0.008)
Average working days per week		0.029**	0.032*		0.004	–0.004
		(0.014)	(0.017)		(0.054)	(0.060)
Job experience (in apparel production)	–0.012	–0.022	0.005	0.159***	0.176***	0.181***
	(0.027)	(0.027)	(0.034)	(0.049)	(0.049)	(0.053)
Job experience (other than apparel)	–0.103	–0.113	–0.132*	0.040	0.045	0.083
	(0.066)	(0.067)	(0.065)	(0.058)	(0.063)	(0.056)
Practical training during school			0.047			–0.073

			(0.033)			(0.045)
Constant	4.531***	4.403***	3.802***	4.519***	4.466***	4.749***
	(0.136)	(0.133)	(0.357)	(0.235)	(0.452)	(0.491)
Observations	43	41	41	58	55	49
R^2	.376	.384	.497	.417	.434	.494
Control for education	Yes	Yes	Yes	Yes	Yes	Yes

Source: Data from Skills and Knowledge for Youth Program assessment.
Robust standard errors are in parentheses.
*p < .1. **p < .05. ***p < .01.

First, we find that the group with higher self-evaluations has lower practical skills than the lower-self-evaluation group. This tendency is common in the informal and formal sectors but is especially pronounced in the informal sector. This result is similar to the results of Kruger and Dunning's (1999) paper, known as the Dunning-Kruger effect. Their study administered a logical thinking and grammar test and asked the test takers to estimate their rank among test takers. The results showed that those with higher test scores estimated their rankings correctly or slightly lower, while the group with particularly low test scores estimated their rankings much higher. This suggests that a lack of metacognitive skills prevents people from recognizing that they are less competent; in a study by Kruger and Dunning. (1999), people could better estimate their abilities appropriately after receiving feedback on relevant content. This suggests that an effective means of improving competence for actual workers may be to give them feedback to understand their skill levels.

Previous work experience also was found to be significantly related to current practical skills. There was not a significant difference in ability between those who had no previous job and those who had a previous job (in the apparel industry) in the formal sector. On the other hand, in the informal sector, those whose previous job was in apparel were significantly more capable. This difference suggests that job entry implications for people with no previous work experience are different in the formal and informal sectors. Otchia (2019) points out that there are two groups of workers in the informal sector: a group with negative motivations who are unable to find a formal job and consequently work in the informal sector and a group with positive motivations who choose to work in the informal sector. Those who obtain jobs in the formal sector without previous work experience are generally considered to be successful in the labor market because they obtained formal employment immediately after finishing school and were likely to have some skills at that time. In contrast, those who have no previous work experience in the informal sector are more likely to be working in the informal sector for the

negative reason that they did not have the skills to obtain employment in a formal workplace. For this reason, there is likely to be a large gap in ability between them and those who have previous work experience and have acquired sufficient skills and knowledge.

5.4 Summary and discussion for policy implications

This section highlights the different natures of the formal and informal sectors. First, we showed a difference in wages between the two sectors and that this difference can be explained to some extent by differences in practical skills and personality. We then compared the more detailed descriptive statistics of practical skills and personality traits by dividing workers in the two sectors into lower- and higher-wage groups, respectively. The results showed a difference in sewing scores between the lower- and higher-wage groups, which was the same across the formal and informal sectors. In terms of personality traits, some trends differed across sectors, and some were common.

Interesting to note, there was a higher-scoring personality trait in the higher-wage group and a lower-scoring personality trait (hostile attribution bias). This may shed light on which characteristics prevent people from having better opportunities in the labor market. According to OECD (2018), some personality traits (e.g., conscientiousness) appear to predict performance and wages across a broad range of occupational categories, whereas the predictive effect of personalities usually depends on the jobs. It is necessary to study further which kinds of personality traits contribute more in the Ghanaian context and how the effect differs between the formal and informal sectors.

To get an idea of how practical skills are affected by workers' personalities, we also focused on meta-cognition. As a result, we found that workers who tend to overestimate their own abilities have lower practical skills. This may be because a proper understanding of one's own skills leads to appropriate efforts at improvement. In other words, the capacity for self-learning may be the cause of the difference in practical skills. Having too much confidence, in contrast, may not entice workers to improve their skills since they are satisfied with their skills.

In conclusion, the soft skill of self-learning can make a difference in practical skills. This study points out the importance of meta-cognition for self-learning to improve skills (Kruger and Dunning 1999). It is expected that an approach that improves the capacity for self-learning, rather than simply increases training in practical skills, will contribute to skill improvement.

Feedback to promote proper awareness of the current situation and effort would be an effective means.

6 Career aspirations and skills of TVET trainees

This section focuses on the school-to-work transition by investigating trainees' perspectives. The reasoning of schooling must be related to what students want to do/be after graduation. For TVET trainees, there can be three options: (1) to continue schooling, (2) to work as an employed worker, or (3) to work as a self-employed worker. Most of the existing studies focusing on the school-job transition have assumed that getting a job in the formal sector is the most desirable career course for a worker. Becoming a self-employed worker (most often in the informal sector), on the other hand, has been regarded as a negative course taken by someone who couldn't get a formal job. However, there can be both positive and negative reasons for becoming a self-employed worker, and it is a fact that some self-employed workers are economically successful. We should carefully investigate how trainees themselves want to be to understand the internal mechanisms of the transition from schooling to work. Therefore, this section explores trainees' perspectives, paying attention to their career aspirations.

6.1 Methodology and data

The data we use in this section are the result of a questionnaire for trainees in four TVET institutions, including three schools offering the course in TVET Levels 1 through 4, and one technical university offering the course in TVET Level 5. On the questionnaire, we asked the future plans of trainees—whether they intend to continue schooling, work as factory workers, or work as self-employed.

The descriptive statistics of the data used in this study are shown in Table 14. The total number of participant trainees is 318, of whom 244 are TVET Level 1 through 4 trainees and 87 are TVET Level 5 trainees. Naturally, the age and written test results are higher for TVET Level 5 trainees. The household's financial level was calculated by dividing the economic status of the sample population into nine classes (from 1 as lowest to 9 as highest) based on family environment and assets (car, Internet access, etc.). The mean financial level for all trainees was 3.7, and there was a gap of more than 1 between the mean for TVET Level 1 through 4 trainees and the mean for TVET Level 5 trainees. The questionnaire also asked trainees about their plans after graduation. As the educational level increased, the percentage of those who plan to work after graduation became larger. Overall, more trainees were planning

to become self-employed than to become factory workers, and the rate increased when the question was limited to TVET Level 5 trainees.

Table 14 Information about participants

Variable	TVET Level 1–4		TVET Level 5		Total	
	M	*SD*	*M*	*SD*	*M*	*SD*
Sample size (*n*)	244		87		318	
Woman (male = 1, female = 2)	1.9	0.3	1.9	0.3	1.9	0.3
Age	19.4	2.6	23.3	3.4	20.5	3.3
Written test score	53.2	9.2	66.2	6.5	56.6	10.3
Financial level	3.4	2.4	4.6	1.8	3.7	2.3
Future plan = schooling (%)	50		35		46	
Future plan = factory (%)	20		21		21	
Future plan = self-employed (%)	30		44		33	

Source: Data from Skills and Knowledge for Youth Program assessment.
Note: TVET = Technical and Vocational Education and Training.

6.2 Influence of socioeconomic background on trainees' career plans

We tried to find out what kind of factors influence differences in future plans. We distinguished the factors into (1) socioeconomic background and (2) subjectivity. Socioeconomic background includes information such as age, region of origin, house environment, and written test score. For subjectivity, we used responses about self-evaluation and perception of the acquisition of skills from the questionnaire.

In the existing research on the school-to-work transition, socioeconomic background has been documented as an important factor influencing career paths. In addition to family background, it is emphasized that test scores, race, and gender affect access to different types of occupations (Altonji 1993; Webber 2014). Another strand of the literature examines the effect of subjectivity and belief, which are acquired through interactions with the environment and other people (Altonji, Blom, and Meghir 2012). Overall, however, little attention has been paid to trainees' points of view, like why trainees choose their career paths and what those career paths means to them. It is necessary to know how the trainees who are currently in the

training program envision their futures to motivate them to learn and help them choose career paths that are meaningful to them.

Table 15 presents the effects of socioeconomic background. Columns (1) and (2) show the factors that influence whether to continue schooling or to work, and column (3) shows the factors that influence the intention to be either a factory worker or self-employed. Models (1) and (2) include all the samples in the analysis, and the differences in attained educational level (TVET Levels 1–4 and 5) are controlled. Meanwhile, Model (3) is run only with the sample population at TVET Level 5 without controlling the effect of educational level.

Table 15 Influence of socioeconomic background on future plan

	Dependent variable: future (0 = schooling, 1 = working)		Dependent variable: job type (0 = factory worker, 1 = self-employed)
	(1)	(2)	(3)
Variable	All trainees	Only trainees in TVET Level 5	All trainees
Father's job (1 = formal job, 0 = other)	–0.852	–0.858	–0.694
	(–2.590)***	–1.240	–1.490
Mother's job (1 = formal job, 0 = other)	0.052	–0.175	0.725
	–0.120	–0.220	1.080
From northern region (1 = yes, 0 = no)	–1.752	0.000	0.000
	(–2.19)**		
Financial level (compared with the lowest group = 1)			
Financial level = 2	0.367	2.468	–0.163
	–0.880	(1.760)*	–0.300
Financial level = 3	–0.415	1.446	–0.605
	(–0.97)	1.090	–1.020
Financial level = 4	0.592	3.527	–0.231
	–1.350	(2.210)**	–0.410
Work experience (1 = yes, 0 = no)	0.464	0.449	–0.079
	–1.460	0.710	–0.190
Age	0.110	0.174	0.042
	(1.730)*	1.330	0.570
Score on written test	–0.051	–0.011	0.017
	(–2.760)***	–0.240	0.740
_cons	0.566	–7.405	–0.775
	–0.270	–1.160	–0.330
Observations	245.000	66.000	136.000
Log likelihood	–147.746	–35.465	–87.347
Pseudo R^2	.112	.156	.020
Control for TVET level	Yes	No	Yes

Source: Data from Skills and Knowledge for Youth Program assessment.

Note: TVET = Technical and Vocational Education and Training.

*p < .1. **p < .05. ***p < .01.

The results shown in Table 15 indicate several findings. First, socioeconomic background, including family background and test score, largely affects trainees' intention either to continue schooling or to work, while socioeconomic background has less influence on the type of work trainees aspire to do after graduation, namely, whether to be factory workers or self-employed workers. Second, significant differences exist by education level within socioeconomic background, as can be seen in Models 1 and 2, which compare the overall pattern against Level 5 TVET trainees. At a lower education level, the father's job type, region of origin, and written test score are more influential. In particular, the probability that those whose fathers are in formal employment will try to proceed to a higher education level is higher. However, at the higher-education level, these factors do not have a significant effect; the household's financial level is more significant.

These results indicate that having a father working in the formal sector makes the trainee intend to pursue a higher education level. In Ghana, as in many African countries, whether a person has a certificate of higher education is a significant determinant of whether he or she can get formal employment. Trainees tend to aspire to formal employment particularly if their parents are formal-sector employees. Since there is a widespread conception that school certificates matter for improving the chances of such employment, trainees try to get higher education certification. The tendency to aspire to continuing education is stronger among trainees whose written test scores are higher.

6.3 Influence of subjectivity on trainees' career plans

The results in the previous section show that test scores and family background influence whether trainees continue schooling. On the other hand, the types of work trainees aspire to do not differ much according to the family background and test score. Then what does the kind of work matter? While Table 15 shows the impact of socioeconomic background, Table 16 shows the effect of perceptions about skills on career aspirations. We used trainees' perceptions of skills, such as "the type of skill they regard as important in the workplace," and self-evaluation by trainees as factors indicate subjectivity. Variables whose names start with "importance" refer to the perceived degree of importance rated by the respondents, and variables with the prefix "confidence" represent the self-evaluated degree of competence in respective domains of skills.

Table 16 Influence of subjectivity on future plan

	Dependent variable: future (0 = schooling, 1 = working)		Dependent variable: job type (0 = factory worker, 1 = self-employed)	
Variable	Model 1	Model 2	Model 3	Model 4
importance_machine operation	–0.194		–0.081	
	0.446		–0.210	
importance_quality control	0.287		–0.217	
	0.247		–0.660	
importance_garment structure	–0.309		–0.268	
	0.201		–0.690	
importance_pattern making	–0.044		0.660	
	0.861		(1.66)*	
confidence_business skill		0.381		–0.702
		0.177		–1.440
confidence_garment structure		–0.281		1.273
		0.249		(2.55)**
confidence_finishing		0.119		0.303
		0.641		0.690
confidence_machine operation		–0.114		–0.758
		0.616		(–2.16)**
_cons	–3.643	–6.451	–3.643	–6.451
	(–1.06)	(–1.49)	(–1.06)	(–1.49)
Observations	146.000	146.000	76.000	78.000
Log likelihood	–85.305	–87.653	–42.863	–40.239
Pseudo R^2	.150	.124	.152	.218

Source: Data from Skills and Knowledge for Youth Program assessment.

Note: Job type, region of origin, financial level, work experience, age, and score on written test are controlled.

*p < .1. **p < .05.

The results show that, while subjectivity does not influence whether to continue schooling or to start working, it does influence the choice of whether to be a factory worker or to be self-employed. Interesting to note, self-evaluation of trainees of their skills shows different tendencies between those who intend to be factory workers and those who intend to be self-employed workers. Those who intend to be factory workers are likely to be more confident about their skills related to machine operation and less confident about skills related to understanding of garment structure than those who intend to be self-employed workers.

The results are understandable when we think about the different natures of work of factory workers and self-employed workers. Usually, self-employed workers deal with various types of work by themselves. The work includes measuring, hearing customer requests, maintaining machines, making patterns, cutting, sewing, ironing, and finishing. To make a dress from several pieces of cloth, the worker must understand how the pieces of cloth will constitute the dress. On the other hand, work and labor in the factory generally are highly divided. It is unlikely that those who deal with cutting patterns would also deal with machine sewing. Even within the sewing division, workers do not necessarily have to have a comprehensive and structural understanding since workers are usually assigned to sew specific parts. For example, one person always deals with collars, and another always deals with sleeves. When it comes to machine operation, a self-employed worker uses a machine he or she is accustomed to, whether it is an old manual one or an industrial machine. There is less necessity for him or her to learn to operate and introduce a new type of machine to the workshop. However, a factory worker must adapt him- or herself to the apparatuses used in the factory. One of the most common challenges employers face is that TVET graduates tend not to be familiar with the latest industrial sewing machines.

6.4 Summary and discussion for policy implications

This section reveals the determinants of career aspirations of trainees. Many existing studies point out the significance of family background and financial conditions as determinants of years of schooling. Similarly, other studies try to explain why someone may become self-employed by focusing on family background or financial disadvantage in career development. While it is important to reveal the structural problems that produce inequality in opportunities, such discussion tends to overlook trainees' perceptual choices. *Perceptual aspects* here means the type of job trainees are interested in, their motivation to learn, and the types of skills at which they consider themselves good and not good.

This section shows that while family background is the most significant factor in deciding whether to continue schooling or start working, when deciding about types of employment (whether to be a factory worker or a self-employed worker), subjectivity is a more vital determinant. This result indicates that trainees try to judge the type of work that seems appropriate for themselves, based on their assessments of the nature of work of factory workers and self-employed workers. Considering that their self-image relating to jobs and skills

strongly affects career choice, it is essential to let trainees imagine how the skills they are trying to acquire will be used in job places, not just provide training without context.

7 Conclusion

This report analyzes the data gathered from November 2018 to February 2019 for several aims. First, it aims to understand the structure of mismatched perceptions about necessary skills among stakeholders: TVET trainers, trainees, employers (production managers), and workers. In addition, the study tries to understand skills better, using various analytical approaches. Since skills that affect workers' actual performance are complex and should be captured from multiple dimensions, our study looks at the relationship among (1) cognitive skills, (2) noncognitive skills (behavioral skills and personality), (3) and practical vocational skills. Furthermore, the study investigates the relationship between skills, wages, and career formation. This section presents three discussion points based on the SKY assessment's key findings: (1) a multidimensional model of skills and performance, (2) the perception gap between stakeholders, and (3) a comparison of the formal and informal sectors.

7.1 A multidimensional model of skills and performance

The SKY Project aims to reveal the nature of skills that enable workers to perform better in the workplace. In the context of the actual workplace, workers are required to combine different skills to adapt to changing situations and solve problems. Based on this understanding, we break down skills and examine how each element is interrelated.

The results of Section 3 provide data that helped us understand how different types of skills relate to and mutually enforce one another to result in better performance. It is notable that cognitive skills have a strong relationship with practical skills. The results show that a firm basis of vocational knowledge supports practical skills. Such a theoretical understanding of vocational skills is supported also by other cognitive skills, especially reading and integrated skills. The results indicate that it is important to discuss how to make a better synergy, rather than a dichotomy, between theory and practice to enhance overall performance and promote the self-learning process. To do so, the TVET sector and industrial sector should work closely to understand what should be taught theoretically or practically and how to share the teaching role and collaborate more effectively.

The study also shows the importance of noncognitive skills. Behavioral skills and personality traits were significantly related to performance on both written and practical tests.

In particular, obedience, which may relate to workers' abilities to adapt themselves to a workplace's regulations and norms, was significant for better performance. The results indicate that providing training related to vocational skills is not enough to improve workers' performance. Still, noncognitive skills, which can be formed without much training, will help workers be efficient in the workplace.

Section 5 also provides exciting findings in terms of workers' metacognition and their performance. Metacognitive skills matter toward whether people estimate their abilities appropriately. It is indicated that through metacognition—in this case paying attention to the gap between self-evaluation and actual performance—workers may improve their skills. Lack of metacognition might prevent people from recognizing that they are less competent. This finding suggests that if workers understand the gap between their current and expected levels of skills by being provided feedback from trainers, the self-learning process might be promoted. Providing opportunities for reflection is a critical point in skills development.

7.2 The perception gap between stakeholders

In Section 4, we present data on the perception gap between various layers of stakeholders. We would like to reflect on the critical gaps we present. First, analysis of the perceptions of trainees and factory workers, in contrast to the perceptions of production managers, shows several critical gaps. We asked the perceived importance of 30 general (basic cognitive and behavioral) skills and 40 garment-related skills. Comparative analysis of general skills clearly shows that a big gap between potential workers and employers exists regarding behavioral skills. While production managers expect their factory workers to think independently about what to do and take initiative by themselves, trainees and employees disregard these skills, which indicates that they tend to think they simply must perform the tasks in front of them without considering overall productivity. Based on these observations, it is recommended that trainees be made aware of a desirable working attitude before they enter the labor market to meet employers' expectations.

When it comes to 40 garment-related skills, a bigger perception gap is found regarding quality control skills. Though production managers highly value quality control skills, trainees are not necessarily aware of their importance. It was revealed that even trainers tend to disregard the importance of skills related to quality control. Skills of quality control involve attitudinal and behavioral skills. Therefore, to improve workers' skills related to quality control,

training that focuses on attitudes and values will be necessary. Apart from that, knowledge of fabric and trim is a skill about which workers are less confident, despite the emphasis placed on this skill by production managers. Since there are fewer opportunities to input pure knowledge in workplaces, equipping people with enough theoretical knowledge will continue to be an important role for TVET training and off-the-job training.

7.3 Comparison of the formal and informal sectors

Though it is important to see the perception gap between employer and jobseeker, it should not be forgotten that Ghana's labor market is characterized by the parallel existence of the formal and informal sectors. Our study shows that a wage gap exists between the formal and informal sectors, but skills largely explain the gap. Section 5 presents how skills are different between the higher-wage and the lower-wage groups and between factory-based and informal workers. The findings highlight that the level of sewing skills explains the difference between the higher- and lower-wage groups in both the formal and the informal sectors. Since informal-sector workers generally lack practical skills compared to formal-sector workers, practical training focusing on sewing skills may be necessary. Apart from practical skills, we find that higher-wage and lower-wage groups demonstrate different types of personality traits. Among the eight personality traits we adopted (extraversion, conscientiousness, openness to experience, neuroticism, agreeableness, grit, hostile attribution bias, and decision making), decision making was higher in the higher-wage group while hostile attribution bias was lower for the higher-wage group in both sectors. The results also indicate that personality traits that enhance better outcomes in the labor market depend on context, whether in the formal or the informal sector. Extraversion, conscientiousness, and openness show different results between the formal sector and the informal sector. In the informal sector, extraversion may help workers to better their connections with customers and to obtain good opportunities and information from peers, while conscientiousness and openness may be required for formal-sector workers to build effective relationships organizations. To better match workers and the labor market, it is crucial to pay attention to personality traits and the behavioral tendencies required in various work contexts and to make workers and trainees aware of them.

In Section 6, the analysis focuses on trainees' perceptions. We find that trainees' self-evaluations of their skills influence their career aspirations. For example, those who think themselves not good at machine operation tend to want to be self-employed workers rather than

factory workers. Interesting to note, trainees develop their conceptions of workplace characteristics based on information they have heard from someone, and accordingly, they develop career plans that differ between the formal and informal sectors. Our analysis indicates that programs that support trainees in strengthening the skills at which they feel they are weak would be effective for career development. At the same time, equal and transparent distribution of information about job opportunities and workplace characteristics is crucial to trainees' making better career choices. An environment with more information will better match supply and demand in the labor market.

7.4 A last thought

In the Conclusion, we have reviewed the SKY assessment's key findings and discussed the policy implications of those findings. What we have considered in the previous three sections, however, never will be realized without close collaboration and mutual trust between stakeholders: government, training institutions, and industries. Given the limited capacities of schools and firms, it is indispensable that all stakeholders come together, share a holistic picture of goals, and then discuss how to divide the tasks to meet common goals. As we've discussed in this report, workers' performance is based on the combination of skills. And each skill can be attained through different experiences (i.e., schooling, apprenticeship, working in factories, helping with the family business, dealing with other small projects/businesses). Therefore, a skill-formation system should be discussed holistically, with broad stakeholder participation, removing the barriers between stakeholders such as between training institutions and industries or the formal and informal sectors. To make informed political decisions, promoting evidence-based discussion is indispensable. We hope the evidence provided in this report will serve as the basis for further discussion among stakeholders, led by the Ghanaian government's strong leadership.

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