

Pacific Alliance Countries: Policy Framework Report on Vocational Education and Training

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Pacific Alliance Countries: Policy Framework Report on Vocational Education and Training

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Expert biographies

Dr. Ursula Renold is head of the research centre for comparative education systems at the Swiss Federal Institute of Technology (ETH) in Zurich. Co-Director of the Centre on the Economics and Management of Education and Training Systems (CEMETS). In addition, she is Chairman of the University Board of the University of Applied Sciences and Arts, North-western Switzerland. She was a Visiting Fellow at the Harvard Graduate School of Education between September 2012 and March 2013.

Prior to this, Renold was Director General of the Federal Office for Professional Education and Technology (OPET) until June 2012. In this position, she headed Switzerland's competence centre for professional education, the universities of applied sciences, and led programme innovation starting in 2005. Before becoming Director General, she was head of OPET's Vocational Education and Training Division and Director of the Swiss Federal Institute of Vocational Education and Training (VET teacher education). During her career, Renold has launched numerous key initiatives that have had great impact on the Vocational and Professional Education and Training system in Switzerland.



Dr. Renold was responsible for the transition process in the wake of Switzerland's constitutional reform of 1999, in which the occupational fields of health, social work, art, agriculture, and forestry became federal competences under one ministry. She has also been involved in the constitutional reform of 2006 and was involved in all related legal reforms in the field of higher education, vocational and professional education and training, continuing education, and the education monitoring process. She holds an honorary Professorship in Professional Education at the University of Applied Labour Studies in Mannheim (Germany).



Dr. Katherine Caves is a postdoctoral researcher in the research centre for comparative education systems at the Swiss Federal Institute of Technology (ETH) in Zurich. She has a bachelor's degree from the University of California at Berkeley and earned her master's degree in the field of Education. Her PhD research was on the economics of education at the University of Zurich.

Her research interests centre around the economic, institutional, and infrastructure foundations of strong vocational education and training (VET) systems all over the world, especially what those foundations are in successful VET systems and how they can be developed in nascent VET systems. In addition to this project, she is currently working on identifying the success factors and barriers to labour market-oriented education systems reforms with the Centre for the Economics and Management of Education and Training Systems (CEMETS).



Dr. Johanna Kemper is a postdoctoral researcher in the research centre for comparative education systems at the Swiss Federal Institute of Technology (ETH) in Zurich. She has a bachelor's degree in Economics and Anthropology from the University of Göttingen, Germany and a master's degree in Economics from the University of Vienna, Austria. She did her PhD at the research centre for comparative education systems at the ETH. The focus of her thesis was on labour market regulation.

Her research interest include labour, education and development economics. Currently, she is working for a large research project funded by the SNSF and the Swiss Agency for Development and Cooperation (SDC) under the joint funding initiative "Swiss Programme for Research on Global Issues for Development (r4d programme)". The aim of the project is to investigate under what conditions technical vocational education and training can help to improve the income of the youth.



Maria Esther Egg is a researcher and doctoral student in the research center for comparative education systems at the Swiss Federal Institute of Technology (ETH) in Zurich. She did her bachelor studies in Economics at the University of St. Gallen, Switzerland and graduated in 2010. For the master studies in Economics, she moved to Zurich, Switzerland, and graduated in 2013 from the University of Zurich. Her dissertation area is in education economics and labour economics. Thereby, she focuses on the relation between the youth labour market and vocational education and training.

1 Introduction

1.1 Context

Switzerland and Germany would like to establish close relationships in the field of Vocational Education and Training (VET) in the four countries of the Pacific Alliance (PAC): Mexico, Chile, Columbia and Peru. The present report provides a brief analysis of the education systems of the four countries as well as a short analysis of the challenges and opportunities regarding the improvement of VET in those four countries.

This report starts with a short description of the current VET approaches in the four PAC, followed by an analysis of the strengths, weaknesses, opportunities and threats (SWOT) in each country's governance, training approach and workplace-training, permeability, youth labour market outcomes, and equity with regard to benchmark countries such as Germany and Switzerland. Subsequently, the report emphasizes the importance of capacity building and outlines possible ways of contribution by multinational companies such as Nestlé in order to strengthen the linkages between actors from the education and employment system.

1.2 Purpose of the report and its limitations

This report gives a first overview of the VET systems in Mexico, Chile, Columbia and Peru to understand commonalities and differences among the systems and to raise awareness about the heterogeneity and difficulties in reforming VET systems. The report is thought as background information for developing a Policy Framework to build strong VET systems in the countries of the Pacific Alliance. The following questions are considered:

- What is the current VET approach/system in the four countries of the Pacific Alliance?
- What are cornerstones of the preparation phase for Switzerland and Germany?
- What is the role of companies such as Nestlé in the Policy Framework?
- What kind of strategies for VPET could those four countries envisage in order to develop an evidence-based reform process?

Due to time and resource restrictions, the overview on Mexico, Chile, Columbia and Peru are based on secondary literature. Thus, the report is not completely evidence-based.

Furthermore, it does not contain an in-depth analysis of the current VPET system with regard to our reference framework for strong VET systems. This would require fact finding missions in the respective country as well as some small surveys among stakeholder and expert groups.

2 VET approaches in the four countries of the Pacific Alliance

The following chapter briefly summarizes the VET approaches of the four Pacific Alliance countries. Each chapter starts with the outcomes of the whole education system and the youth labour market situation. To compare the labour market situation of adolescents across countries, the KOF Swiss Economic Institute developed the KOF Youth Labour Market Index (KOF YLM; Renold, Bolli, Egg, & Pusterla, 2014). The basic idea behind this index is that a single indicator, such as the unemployment rate, does not suffice to describe the youth labour market adequately and to provide enough information for a comprehensive cross-country analysis. To improve the information content of such an analysis and to foster a multi-dimensional approach, the index consists of twelve labour market indicators.

The focus of each chapter is a description of the countries' education systems with a focus on vocational education and training (VET) at the secondary level and professional education and training (PET) at tertiary level. Furthermore, the last part of each section describes the governance of the countries' vocational and professional education and training (VPET) systems, pointing out major gaps and problems when they arise.

2.1 Mexico

Students typically complete lower secondary education at age 14 to 15. At this stage of the education system, the Programme for International Student Assessment (PISA) measures student achievement internationally across three categories: mathematics, reading and science. The last major effort dates back to 2012, where Mexico performed rather poorly (rank 53 out of 65). The score differences between Mexican students and the OECD average in all three categories corresponds to a deficit of almost two years of schooling (OECD, 2014).

The youth labour market is of critical importance for Mexico's economy. In 2015, 50 percent of the country's population was under the age of 28 years. The median age of the population in the neighbouring United States is over 10 years higher (CIA, 2016). Mexico's KOF Youth Labour Market Index, which captures the labour market situation of 15-to-24-year-olds (for more information see Renold, Bolli, Egg, & Pusterla, 2014) is slightly above the OECD average. However, Mexico's index score is built on only three out of 12 indicators because data is missing for the others.

This section describes the education system of Mexico before focusing on the VET programs at the upper secondary level and PET programs at the tertiary level.¹ The current Mexican VPET system will become the foundation upon which initiatives from this project are built.

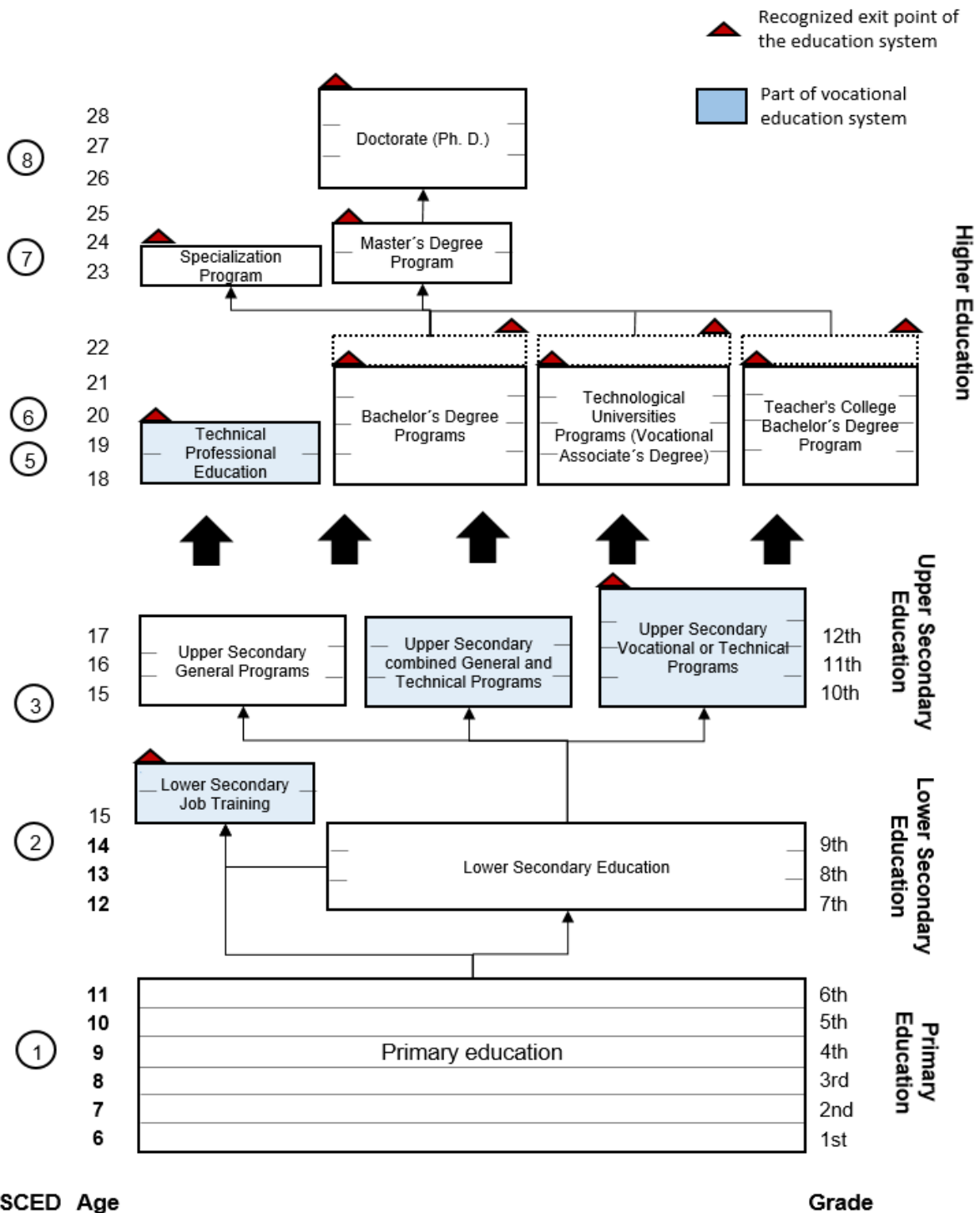
2.1.1 The Mexican education system

According to UNESCO-UIS (2016a), roughly 41.2 million students were enrolled in the Mexican education system across all levels in 2014. However, the educational attainment of the adult population—aged 25 years and older—is very diverse. More than 20 percent never completed primary education and

¹ All the information in this case study are part of the KOF Education System Factbook: Mexico (KOF Swiss Economic Institute, 2017).

another 20 percent quit school after primary education. Although roughly 40 percent have finished lower or upper secondary education, a mere 15 percent went on to tertiary education.

Figure 1: The Mexican Education System²



Source: KOF Education System Factbook: Mexico (KOF Swiss Economic Institute, 2017)

² The size of the boxes does not coincide with the actual size or importance of the program in the education system.

The Mexican education system is displayed in Figure 1. Education is compulsory from pre-primary education to upper secondary education (approximately age 3 to age 18). Pre-primary education lasts about three years. Then, students enter primary education at age six and stay another six years (UNESCO-UIS, 2016c). The typical entry age for lower secondary education is 12. This stage contains two pathways: a general education pathway (*Educación Secundaria*) and a combined general education and vocational pathway (*Secundaria Técnica*). Most students choose the general education pathway. Independent of students' chosen pathway, it takes three years to complete lower secondary education. Upon completion, students receive a secondary education certificate. This degree enables students to move to upper secondary education (UNESCO-UIS, 2013; UNESCO-IBE, 2010).

Students typically enter upper secondary education when they are 15 years old. This stage is divided into three broader pathways: general programs, combined general and technical programs, and technical programs. All three programs types take three years to complete and prepare graduates for tertiary education. However, the latter two are more vocationally oriented and prepare graduates for entry into the labour market as well.

At the tertiary level, students can choose among a bachelor's degree at a university, a bachelor's degree at a technical university, and technical professional education (UNESCO-UIS, 2013). The bachelor programs last between four and five years, and both types enable students to continue with masters and later doctoral programs. Technical professional education lasts two to three years and focuses on preparing students for technical professions.

2.1.2 Vocational education and training (VET)

The Mexican VET system was founded in 1979 and saw curriculum adjustments in 1990, 1997, 2003 and 2008 as reactions to changing economic circumstances. Since 1995, there has also been an outreach program to marginalized communities and the programs have shifted to competence-based education. In 1999, changes were implemented that moved vocational education from a heavily centralized to a federalized system (BiBB, 2013a).

VET at the lower secondary education level

VET (*Secundaria Técnica*) at the lower secondary education level combines general education (40 hours a week) and vocational training (8-16 hours a week). For the vocational part, students have to choose one out of about 20 specializations, which are distributed across the agricultural, engineering, clothing industry, trading, or services sectors. In the year 2014, about 21 percent of all students at the lower secondary education level were enrolled in the VET program (UNESCO-UIS, 2016a). The VET program normally lasts three years (iMOVE, 2012).

VET at the upper secondary education level

In 2014, about 40 percent of all Mexican students in upper secondary education were enrolled in a VET program (UNESCO-UIS, 2016a). The vast majority of VET programs is school-based, while the dual-type VET system is rather underdeveloped. Consequently, only a small fraction of students is enrolled in a dual VET program. The public National College of Technical and Professional Education (CONALEP) is the largest provider of school-based and dual VET programs: about two thirds of the students are enrolled in either of its VET programs. The curriculum combines basic training in general vocational topics with training in a chosen vocational specialization. After two years at a vocational school, students attend an obligatory internship lasting about 3 months in a relevant field. Firms offering internships must be recognized as training firms by the Council for Normalisation and Certification (CONOCER, for more details, see section 2.1.4 further below) (BiBB, 2013b).

School-based VET comprises two different pathways, students can choose from 46 professions (BiBB, 2013a). Both pathways take three years to complete and provide access to higher education and the

labour market. One of the two pathways is a combination of general (60 percent) and vocational (40 percent) education (OECD, 2012). This pathway is taught at technical high schools. The curriculum basically contains the same topics as the purely general education program. In addition, it focuses on a particular technical field and ends with the technical baccalaureate (Bachillerato Técnico; UNESCO-UIS, 2013). The second of the two vocational pathways comprises a slightly larger share of vocational education (65 percent) and fewer general topics (35 percent) (OECD, 2012). The program aims to train professionals for industrial, trading, service and agricultural activities. Students who complete this pathway receive the vocational upper secondary education certificate (Profesional Técnico - Bachiller; UNESCO-UIS, 2013).

The scope of the dual VET program is much smaller than its school-based counterpart. Between 1993 and 1998, a first attempt was made to implement a dual VET program comparable to the one in Germany. The program was based on a partnership with Mercedes-Benz. In 2013, 1,200 students took part in this program (BiBB, 2013b). The entry age for this program is 16 or older, and students need to be enrolled in a teaching institution that offers the dual VET pathway (e.g. CONALEP). The program lasts three years and consists of 75 percent practical training at the workplace under the guidance of a supervisor, who has to stick to an agreed work plan, and 25 percent theoretical training provided by the schools through an e-learning platform (BiBB, 2013b). As a third component of the dual VET system, students receive supplemental training in inter-company courses (six in total for three weeks each). These courses cover topics that individual training firms cannot cover due to a lack of material or teaching abilities. The curricula of the programs have to comply with the competency standards of the system, which are listed in the National Competence System (Sistema Nacional de Competencias, SNC; UNESCO-UIS, 2016c). The companies bear the costs of their trainees. In 2011, a scholarship system was introduced to reduce some of the financial burden borne by the companies.

The evaluation of students in dual VET is carried out by the school and the firm (UNESCO-UIS, 2016c). The teaching staff of CONALEP does the final examinations. Marks are given for the inter-company training courses, company assessments and a final project. Students that complete a vocational program with CONALEP may also take an additional exam at the German-Mexican Chamber of Industry and Commerce (CAMEXA) in order to obtain a Chamber certificate corresponding to the German dual model. Under the *Education Sector Program 2013-2018*, the Secretariat of Public Education (SEP) intends to expand the program further, aiming for 10,000 trainees by 2018 (SEP, 2016). In 2014, Mexico also entered a partnership with two German Ministries: under the project name “Further development of the Mexican dual VET model (MMFD),” the SEP collaborates with the German Federal Ministry for Economic Cooperation and Development (BMZ), and the Federal Ministry of Education and Research (BMBF; BiBB, 2016).

2.1.3 Professional education and training (PET)

The Mexican PET system is mainly based in undergraduate tertiary education. Students attain technical professional education at specialized technical institutions or regular universities that offer vocational programs. Students completing training at a regular university earn the degree of university technical professional education (*Técnico Superior Universitario*, also referred to as *Profesional Asociado*). If they complete a program at a technical institution, the pathway is simply called technical professional education (*Técnico Superior*). The programs typically take between two and three years to complete. Some universities classify them as intermediate degrees. Depending on the program, students can also move into regular bachelor’s programs (*licenciatura*) with these degrees. The stage of the bachelor’s program at which students can enter varies by specialization and region (EP-Nuffic, 2015a). Mexican PET institutions show similarities to community colleges in the United States.

2.1.4 Key actors in the Mexican VPET system

Numerous government and non-government bodies hold roles in the Mexican VPET system. In some cases, their activities are not confined to the VPET system alone. Compared to international standards, the institutional landscape of the Mexican VPET system is considered very complex; its VPET system is composed of over a dozen subsystems with a large number of school types and corresponding administrative divisions. Below, we list the most important bodies that do have a stake in vocational or professional education and training.

Government

According to the General Education Law, both federal and state governments are responsible for the administration of the VPET system. On the federal level the Secretariat of Public Education (SEP) and its Under-Secretariat for Upper Secondary Education (SEMS) are responsible for VET formalities and VET programs, respectively. The SEP has sole responsibility for the regulation of general education and vocational education and training in Mexico. Furthermore, it is responsible for training at work, teacher training and certification; with assistance from the Ministry of Labour on the work-based part of training and certification matters.

At the federal level, the SEP works with other government bodies to manage upper secondary VET through various Directorates-General (DG). These include the DG of Industrial Technological Education (DGETI), DG of Agriculture and Livestock Education (DGETA), DG of Sea Science and Technology Education (DGECyTM), and DG of Training Centres for Work (DGCFT). Given the decentralization of the VPET system, the SEP also collaborates state authorities including numerous national and regional institutions (UNESCO-UNEVOC, 2015; OECD, 2012).

At the state level, each state government has its own Ministry of Education that is responsible for the administration of “decentralized institutions of state governments with federal participation” such as the State Centres for Scientific and Technological Studies (CECyTE) and Institutes of Training for Work (ICAT). As for the CONALEP, both federal and state governments are responsible for its administration. Since state governments are also responsible for the “decentralized institutions of the federations”, they manage most of the CONALEP schools with the exception of CONALEP schools in Mexico City and Oaxaca that are managed by the federal government. In addition, many municipalities offer educational services at all levels (UNESCO-UNEVOC, 2015).

CONALEP is the main governmental body that monitors the VET system. It is one of the leading VET institutions providing VET programs in compliance with the MMFD.

According to UNESCO (2015, p. 9) CONALEP’s primary objectives are to:

- Develop new programs according to the demands of the labour market;
- Update the curriculum and teaching equipment;
- Reduce the failure and school drop-out rate;
- Implement strategies to develop scholarship programs for students;
- Strengthen CONALEP’s international cooperation in the field of VET;
- Implement strategies to expand the number of opportunities for students to attend schools;
- Promote links with the industrial sector to reduce the unemployment rate.

Also according to UNESCO (2015), there are two other important institutions involved in the governance of the Mexican VET system: The DG of Higher Technological Education (DGEST) and the DG of Industrial Technological Education (DGETI). The DGEST is responsible for the National System of Technical Institutes (SNIT), whose purpose is to strengthen VET by improving VET services offered, ensuring better access to VET programs, promoting the application of Information and Communications Technology in VET programs, and improving school and institution management structures. The DGETI also

deals with vocational education and its aim is to provide training on technological expertise in the industrial, commercial and service sectors (UNESCO-UNEVOC, 2015).

The Council for Accreditation of Higher Education (COPAES), founded in 2000, is the only institution that is entitled by the SEP to confer official recognition to accrediting agencies of academic programs. Accreditation bodies recognized by the COPAES are empowered to carry out the evaluation process leading to the accreditation of programs of undergraduate and graduate or professional senior technical associate, in defined areas of knowledge and in public and private institutions around the country. An official recognition of an accreditation body and the accreditation of academic programs lasts five years. After this time, it is subject to renewed recognition (UNESCO-IBE, 2010).

Employer engagement

Employers' engagement in Mexico's VPET system remains weak. At the national level, there is no involvement of the employer side. At the state level, there are the State Commissions for the Planning and Programming of Upper Secondary Education (CEPPEMS), which are responsible for coordination between state level authorities and various subsystems. However, since the CEPPEMS includes only a minority of employer representatives they play a correspondingly minor role in these commissions (OECD, 2012). There is still no legally binding concept that integrates employer and employee representatives as well as the state as equal partners in the development of a dual VET system (BiBB, 2013b).

Another advisory body is the CONOCER. It provides technical assistance for companies and federal entities in forming Management Committees. The aim of these committees is to represent the interests of industry, as company owners and managing directors, chambers of commerce and trade unions and to get involved in defining competence-based standards, as well as in the evaluation and certification procedure. CONOCER is the only body in Mexico that can approve official certificates of competency (UNESCO-UNEVOC, 2015). However, CONOCER has limited competence to make decisions because it belongs administratively to SEP (World Bank, 2013).

The National Evaluation Centre for Higher Education (CENEVAL) is a non-governmental and non-profit organization whose main responsibilities are the design and application of evaluation tools for the assessment of knowledge, skills and competencies, as well as for analysis and dissemination of test results at all educational levels. It was established in 1994 (Santiago, McGregor, Nusche, Ravela, & Toledo, 2012).

Education and training providers

The most important VET provider is the CONALEP. It is responsible for around 300,000 vocational students studying in 501 schools across Mexico that are run by the CONALEP. This corresponds to 76.5 percent of all vocational students (UNESCO-UNEVOC, 2015). In addition to the main VET provider CONALEP with its own schools, the CBT (*Centro de Bachillerato Tecnológico*), the CET (*Centro de Estudios Tecnológicos*) and the CECyTE provide vocational education through their schools (BiBB, 2013b). Federal and governmental GDs such as the DGETA, DGETI, and DGECyTM manage these institutions (OECD, 2012). Training for work is offered by DGCFT (World Bank, 2013).

Besides the public VET providers (like CONALEP), there are many private VET providers. There is for example the *Capacitación Automotriz Especializada* (CAE) that is specialized for VET in motor vehicle mechanics, the *Colegio Superior de Gastronomía* (CSG) that is a leading provider for cook training and the *Instituto de Administración Pública Chiapas* (IAP) which is the best-known institution for job profiles in the field of state administration. Particularly, there are many German-owned companies providing VET in Mexico: *Volkswagen de Mexico* describes itself as the pioneer of the dual VET in Mexico, having provided vocational training for the past 50 years. In its VET centre, it primarily trains specialists for its own needs. *Bosch de Mexico* is another company that has been successfully providing VET for years (iMOVE, 2012; Volkswagen, 2016).

2.2 Chile

Chilean students complete lower secondary education between the ages 14 and 15. According to the OECD (2013b), Chile has two main challenges that are the central aspects of its latest educational policies: quality and equity. On one hand, a large proportion of students show low reading proficiency according to PISA 2009. On the other hand, and more importantly, not everyone has access to the same educational opportunities, in particular those with a socio-demographically disadvantaged family background or those from rural areas. School performance varies greatly across the country, and the better schools—mainly the privately managed schools—are too expensive for most of lower-class students. In addition, upper secondary students are still expected to continue on to higher education exclusively.

It is difficult to compare Chile's youth labour-market situation to other countries using the KOF YLMI (Renold, Bolli, Egg, & Pusterla, 2014). Chile has data available for two out of twelve indicators, namely the unemployment rate and relative unemployment ratio. Therefore, conclusions based on this index are very limited.³

2.2.1 The Chilean education system

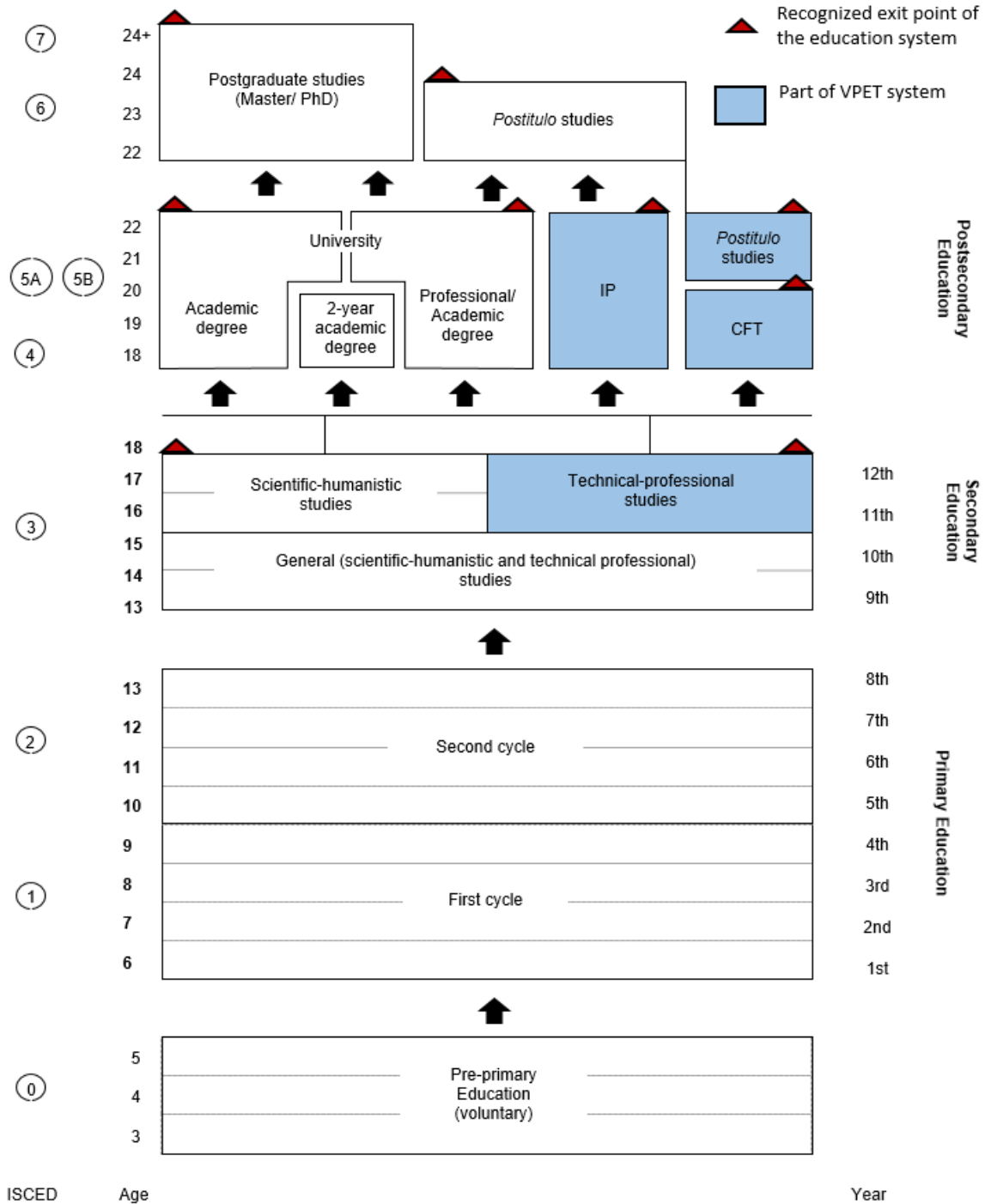
The education system in Chile comprises eight years of basic education (*Educación Básica*) and four years of secondary education (*Educación Media*), which are compulsory. Thereafter, various post-secondary and tertiary education programs are available. VET in Chile is included in the formal education system.

Students start with primary education at the age of six. At the age of thirteen, they enter secondary education. In lower secondary education (two years) students follow a general curriculum with elective courses in scientific-humanistic topics or technical-vocational topics. In the following upper secondary education (two years), they choose between the scientific-humanistic and the technical-professional track, of which the latter is the vocational track. In 2011, about 64 percent of all students in upper secondary education followed the general path, while 36 percent decided for the vocational program (Santiago, Benavides, Danielson, Goe, & Nusche, 2013).

After completion of secondary education, all students receive a school-leaving certificate (*Licencia de Enseñanza Media*). To enter tertiary education, they must pass the national admission test (*Prueba de Selección Universitaria*, PSU). Thus, every student in upper secondary education theoretically has access to any institution of higher education. However, VET graduates have had less general education at the secondary education level and therefore score lower in the PSU, which primarily demands general academic knowledge. At the post-secondary level, the Chilean system provides programs at universities (4-7 years), professional institutes (4 years), and technical training centres (2 years).

³ All the information in this case study are taken from the KOF Education System Factbook: Chile (KOF Swiss Economic Institute, 2015).

Figure 2: The Chilean Education System⁴



Source: KOF Factbook Education System Chile (KOF Swiss Economic Institute, 2015)

⁴ The size of the boxes does not coincide with the actual size or importance of the program in the education system.

2.2.2 Vocational education and training (VET)

As already mentioned, VET in Chile starts in the second year of lower secondary education for those students who have chosen the vocational track (*Educación Media Técnico-Profesional*, EMTP). At the upper secondary level, this track leads to a direct entrance in the job market or to professional studies at the tertiary educational level (Kis & Field, 2009). VET at the upper secondary education level is offered in a range of 46 specializations comprising 14 occupational areas, which again are grouped into six sectors: commercial, industrial, technical, agricultural, marine and artistic studies. Compared to the more comprehensive scientific-humanistic track, which comprises 27 hours of general education a week, the vocational track offers 12 hours of general and 26 of vocational education and training. After the four years of secondary education, students pursuing the VET track receive the secondary school-leaving certificate (*licencia de enseñanza media*). This allows students to enter tertiary-level PET programs, but does not provide access to tertiary-level general education programs (ibid.). The Chilean education system is displayed in Figure 2.

In order to receive a VET certificate, the VET graduates have to attend a period of workplace training. Students are required to spend about four months (480-960 hours) in on-the-job training (*practica profesional*). However, it is estimated that only half of all upper secondary EMTP graduates successfully complete this workplace training. Possible reasons for the low participation rate are the following. For some time, students in workplace training did not receive any financial compensation. Consequently, many preferred to enter the labour market directly (or to be inactive). For those who intended to proceed to tertiary education, the workplace training meant a delay of the entry into university. For others, it might just not be worth the effort to complete the training (Kis and Field, 2009:33).

Only a small share of all VET students is enrolled in a dual VET track (4.5 percent), combining school- and work-based training (Kis and Field, 2009:13). The dual program is limited to the mining sector.

From an equity point of view, one issue is the selection of students into the VET and general education track. On average, VET students have a lower socioeconomic background than students in the general education pathway. A vast majority of students in EMTP programs comes from low-income households. In addition, a substantial part of low-income students is enrolled in public VET schools rather than in private subsidized ones (Kis and Field, 2009).

According to the OECD (Kis and Field, 2009), upper secondary VET provides inadequate basic skills preparation for postsecondary programs: students' literacy and numeracy skills are among the lowest in OECD countries. Furthermore, the OECD criticizes that the quality standards, teacher training, the link between curricula and industry needs and work based learning need to be improved.

2.2.3 Professional education and training (PET)

VET at the tertiary level comprises two-year programmes in technical training centres (*Centros de Formación Técnica*, CFTs) and four-year programmes in professional institutes (*Institutos Profesionales*, IPs). All CFTs and — with the exception of four IPs⁵ — all IPs are private institutions. Studies related to the health sector (e.g. nursing schools) account for most graduates from any of both types of institutions, followed by technical and management as well as commerce studies. Often, CFT institutions are specialized in only a few study areas. Thus, they provide a rather limited number of programs. In contrast,

⁵ Article 99 of the Law No. 18.681 lists all public higher education institutions, among these the four public IPs: Instituto Profesional de Santiago, Instituto Profesional de Chillán, Instituto Profesional de Valdivia e Instituto Profesional de Osorno. It also lists the 15 CFTs that were created by the Law No. 20.910 that was enacted by President Michelle Bachelet in 2016 (see further below for more details) (MdC, 2016).

in IPs students can develop top-level technical careers in fields like technology, agriculture or commerce. Currently, there are about 49 CFTs and 44 IPs (Kis & Field, 2009).

Programs at CFTs and IPs last shorter and are less expensive than programs at normal universities: the programs cost less than half of those at universities. Graduates of CFTs and IPs have high levels of employability: about 80 percent of graduates find a job right after graduating. The earnings of CFT and IP graduates are comparable to university graduates with a bachelor degree (Kis & Field, 2009).

Overall, tertiary enrolment in Chile has increased in the past 20 years. However, most of the growth in enrolment happened in the university sector and not in CFTs or IPs. One reason for this is the relative lower attractiveness of the VPET system in general. Another reason is that many VET graduates are from low-income families who often cannot afford sending their children to higher education institutions. Even though CFTs and IPs are less expensive than universities, the fact that these are mostly private institutions means that students have to cover the full costs of education, which prevents many of the students with lower social-economic background to participate in higher education. Also, because the loan system that is in place cannot support all students (ibid.).

To improve the access, relevance, quality and effectiveness of its VPET system, the Chilean government initiated a reform process in 2015. One goal of this reform is to improve the accessibility of the CFTs. To this end, President Michelle Bachelet enacted a law in 2016, that aims at creating 15 publicly financed CFTs in the upcoming years- one for each region of the country (MINEDUC, 2016). These new establishments will be launched in three groups, each consisting of five CFTs. In contrast to the existing private CFTs, these 15 public CFTs will be free of charge for the students (El Mercurio, 2017). The creation of these schools aims to decentralize the education provision and to increase the regional supply of qualified workers. Each of these institutions will be associated with regional universities, companies and vocational-technical colleges in order to train technicians according to the needs of the local labour markets and to facilitate the effective insertion of students into the world of work (ibid.).

2.2.4 Key actors in the Chilean VPET system

Government

VET in Chile is part of the formal education system and thus under the governance of the Ministry of Education, more specifically under the guidance of its main organ, the National Council of Education (*Consejo Nacional de Educación*). Since a part of the VET education program is meant to happen at the workplace, the Ministry of Labor also has key responsibilities in VET policy and the supervision of different VET programs (OECD, 2010).

The National Council of Education has to approve the educational programs and plans, the curricula and qualification frameworks, and has to manage the national education system in general. The Ministry of Education is organized at the national, provincial and regional level. Each of Chile's 15 regions has a Regional Ministry Secretary (*Secretarías Regionales Ministeriales*) as the representative of the Ministry of Education in the region. They are responsible for the planning, organization and supervision of the VET system and other branches of the education system. One particular function of the Secretaries is to supervise the work of the Unit for Curriculum and Evaluation (UCE), which has the function to coordinate the design and implementation of the curricula (UNESCO-UNEVOC, 2014). Responsible for the quality of education in general is the National Accreditation Commission (*Comisión Nacional de Acreditación*).

Another stakeholder in the supervisory structure of the VET system is the National Innovation Council for Competitiveness (*Consejo Nacional de Innovación para la Competitividad*), which is a public-private body associated with the Ministry of Economy. Its task is to analyze public policies and collaboration

projects between the public and private sector in general, as well as pilot projects on innovation and to deduct recommendations.

Employer engagement

In general, the engagement of the business sector in the provision of workplace training, the definition of skill requirements, the management of strategic direction of the VET system and institutions has been very low in the past (Kis & Field, 2009). And if there is some form of collaboration between VET secondary schools and the industry, the quality and degree of interaction varies hugely, which is also the case for the workplace training after having completed tertiary level education. In 2010, the National Council for Vocational Education and Training (CNFP) was created. It shall serve as a platform for industry representatives, trade unions and stakeholders the education and training sector work together (ibid.).

To assure the quality of workplace training in Chile, the only tools in place are a training plan and visits to the company by the school. Often, the schools simply do not have the resources to fulfil the function of supervising the companies (Kis & Field, 2009). The OECD (2010) suggests that rather than having the school to assure the quality of workplace training, the companies should have the right incentives not to exploit the trainees. In addition, there should be functioning institutional mechanisms in place to reassure a high quality of the workplace training.⁶ One way to achieve this could be through the creation of special apprenticeship contracts, clearly specifying the rights and obligations of the employer and the apprentice

In the near future, the government wants to change the curricula and adjust them more towards the needs of the industry (OECD, 2013a). The success of this undertaking will be highly dependent on the extent to which the business sector will be involved. To ensure a successful implementation of such a policy, the employers need to be involved in designing the system of employer engagement. In countries with a successful VET system like Switzerland, the business sector has a say in the creation of the curricula (most often through professional associations). Giving the business sector the option to participate in the curriculum development, gives them the possibility to adjust the learning content according to their needs and to constantly adapt the curricula to changes in the skills they require.

2.3 Colombia

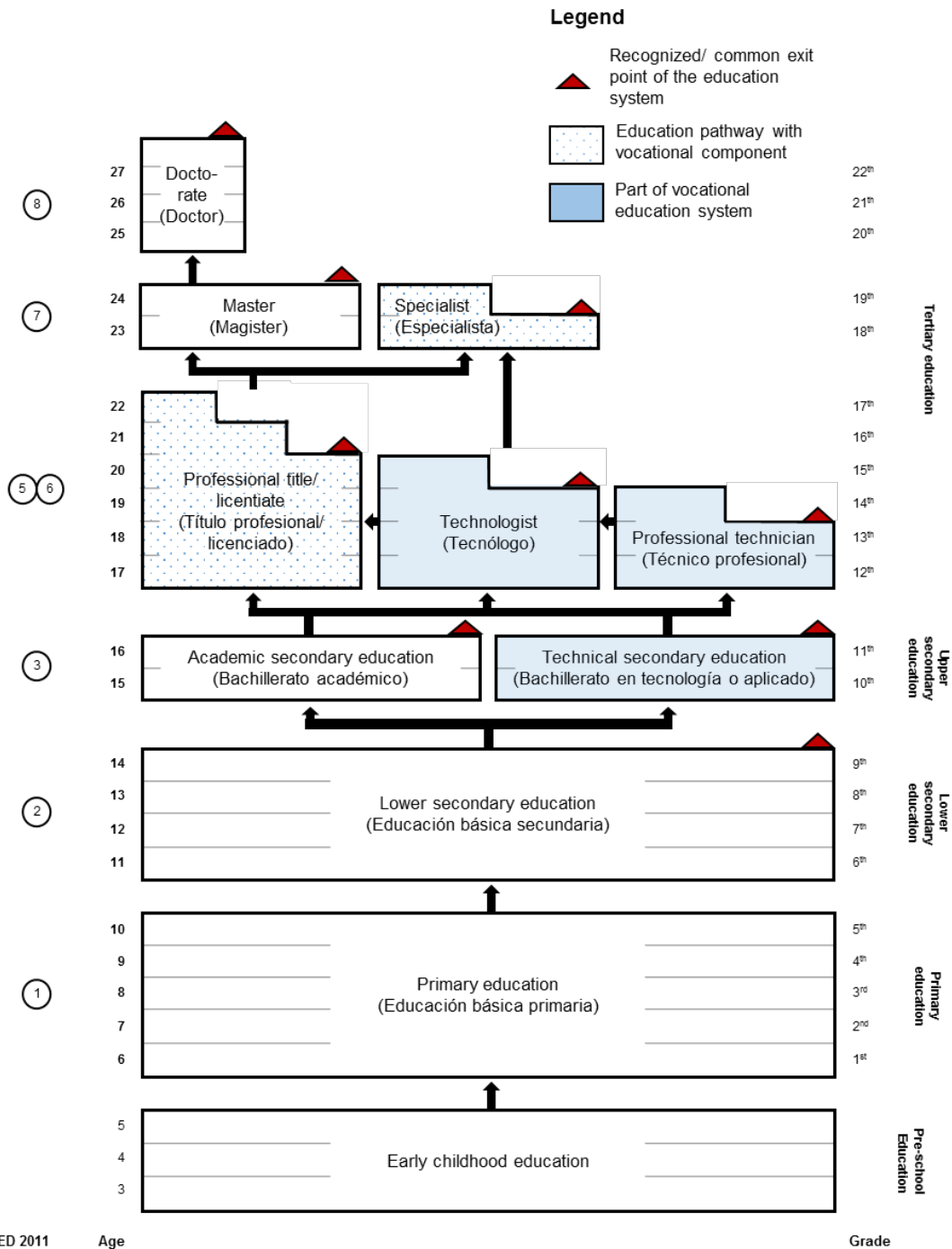
Similar to Mexico and Peru, Colombian students complete lower secondary education when they are 14 to 15 years old. They achieved the fourth-to-last place in the 2012 PISA study, which surveys the scholastic performance on mathematics, science, and reading of 15-year-old students in 65 countries, with an average score of 393 points (in 2012; OECD, 2014). For comparison, Shanghai students achieved the highest score of 588 points in the 2012 PISA test.

Regarding the labour market, Colombia reports four out of twelve indicators of the KOF YLMI, which measures the labour market situation of 15- to 24-year-olds (Renold, Bolli, Egg, & Pusterla, 2014). The KOF YLMI score is 3.99 for Colombia, which is lower than the Latin American average of 4.20 and the

⁶ For an extensive explanation why involving the employers in the design of a VET system makes sense, see Kis and Field (2009).

Swiss average of 5.80 (2012; KOF Swiss Economic Institute, 2016). Both measures indicate weaknesses in the Colombian education system.⁷

Figure 3: The Colombian Education System⁸



Source: Own illustration based on EP-Nuffic (2015b), Immerstein (2015), UNESCO (2011).

⁷ All the information in this case study are part of the KOF Education System Factbook: Colombia (KOF Swiss Economic Institute, forthcoming).

⁸ The size of the boxes does not coincide with the actual size or importance of the program in the education system.

2.3.1 The Colombian education system

The constitution of 1991 and the general law of 1994 guarantees all Colombian residents access to education (OECD, 2016a). Education is compulsory and free for all children aged 5 to 15 (Immerstein S. , 2015; OECD, 2016a). Compulsory education comprises 10 years of schooling—from the last year of pre-school education up to the end of lower secondary education. The Colombian government is thinking about extending compulsory education to include upper secondary education by 2030 (MEN, 2015a found in OECD, 2016a). Figure 3 displays Colombia's formal education system.

Children in Colombia may attend pre-school education for three years. Pre-school is compulsory from the age of five onwards (Immerstein S. , 2015; OECD, 2016a). Primary education starts at age six and takes five years to complete (Immerstein S. , 2015). Pupils start secondary education at the age of 11. This education level is divided into lower secondary education lasting four years and upper secondary education lasting two years (*ibid.*). As compulsory education only includes lower secondary education, students finishing this level have the choice to continue with upper secondary education, enrol in a non-formal technical apprenticeship program or to enter the labour market (IQAS, 2010).

Students continuing with upper secondary education may choose between academic education and vocational education and training (VET) (Immerstein S. , 2015). About 76 percent of students follow academic programs and the other 24 percent VET programs. Both specializations on the upper secondary education level grant access to the nationally standardized examination SABER 11, which is administered by the Colombian Institute for the Evaluation of Education (*Instituto Colombiano para la Evaluación de la Educación*, ICFES) (SABER 11; EP-Nuffic, 2015b; Immerstein S. , 2015; OECD, 2016a). The results of this examination are essential to access tertiary education programs (EP-Nuffic, 2015b).

Higher education follows a three-tier degree structure: undergraduate, graduate and doctoral level. There are four types of tertiary institutes: universities (accounting for 28 percent of enrolment at the tertiary level), university institutions (42 percent), technological institutions (18 percent), and professional technical institutions (13 percent) (OECD, 2016a). However, the university and non-university programs cannot be sharply differentiated in academic education and professional education and training (PET) as some programs contain elements of both (EP-Nuffic, 2015b).

At the undergraduate level, students have the choice between three different programs. The first program is the Professional Technician (*Técnico Profesional*), which takes two to three years to complete. The second is the Technologist (*Technológico*), which takes three to four years and is equivalent to a bachelor's degree granting access to master programs. Lastly, the Professional Title (*Título Profesional*) or *Licenciado* for future teachers (EP-Nuffic, 2015b). At non-university institutes, students can enrol for a Professional Technician degree or Technologist degree, the later giving access to the Specialist degrees at the graduate level (Professional Technical Specialist and the Technological Specialist) (EP-Nuffic, 2015b). At the universities, students start by acquiring a professional title (Immerstein S. , 2015). University graduates have the possibility to earn a master's degree or a specialist degree. Both programs take one to two years to complete (EP-Nuffic, 2015b). For entrance into a doctorate program, which takes about four years, students need a master's degree.

2.3.2 Vocational education and training (VET)

At the upper secondary education level, students have the choice between general (so-called *Bachillerato académico*) and vocational education and training (VET, so-called *Bachillerato técnico/ Bachillerato en Tecnología o Aplicado*). Both take two years to complete. While the academic education programs impart general education in science, arts, and humanities, the first aim of VET programs is to prepare students for the labour market (EP-Nuffic, 2015b; Immerstein S. , 2015). Nevertheless, both types of programs grant access to the national entry examination SABER 11, which is required to enter tertiary

education. Usually, more than two thirds of all students at the upper secondary education level are enrolled in general education and less than a third in a VET program. Most of the subjects the students have to attend at the upper-secondary level are the same in the general education and the VET pathway. Besides these general education courses, students following the VET pathway have to attend additional theoretical and practical vocational subjects (OECD, 2016b).

The number of schools offering VET programs is relatively low. According to data from the Ministry of Education, two thirds of all public schools offer only general education programs, 1.5 percent of the schools offer both, VET and general education programs, while the remainder—roughly a third— offers only VET programs. Most of the schools offering only VET programs are concentrated in rural areas (ibid.).

While some upper secondary schools organize vocational courses on their own, others cooperate with external providers of vocational courses in order to provide vocational courses. Thereby, each school is free to choose to which extent it wants to collaborate with such providers, how it manages the recognition of skills and reassures the quality and relevance of the skills taught in these courses. One example of an external provider of vocational courses is the National Learning Service (*Servicio Nacional de Aprendizaje*; SENA). Since the government introduced the Program for Strengthening Technical and Technological Education (*Programa de Fortalecimiento de la Educación Técnica y Tecnológica*) in 2006, also some tertiary education institutions provide vocational courses. They account for about one fifth of all upper secondary schools (OECD, 2016b).

Students in the vocational pathway must obtain the necessary academic credits in order to earn the *Bachillerato técnico*. For the training received at the SENA or other institutions providing vocational training, students can receive an additional certificate, the so-called *Certificado de Aptitud Profesional (CAP)* (OECD, 2016b).

In 2011, the majority of VET students were enrolled in programs belonging to the commercial sector (38 percent), followed by the agricultural (27 percent), the industry (24 percent), pedagogy (8 percent) and social services (3 percent) sector. The large enrolment share in these latter two sectors reflects the fact that most of the schools that only offer VET programs, are located in rural areas, where agricultural and the mining sector are more present (ibid.).

According to the OECD (2016b), SENA is the largest provider of vocational courses at the upper secondary level, especially in rural areas and specific vocations such as agriculture, mining and industry. About 60 percent of the courses offered by the SENA are at the upper secondary level. In addition, the SENA is the largest provider of tertiary-level technical and technological programs and non-formal education.⁹ Formally, the SENA belongs to the Ministry of Labour. The courses provided by the SENA are free of charge for all students. This creates the opportunity for many schools to provide tuition to students from lower social economic background, who could not afford attending upper secondary education otherwise (SENA & BiBB, 2016).

The majority of vocational courses at the upper-secondary level are school-based. Most of the courses provided by the SENA take place in its schools and inter-company course centres. In addition, students can participate in company-based practical placement or be involved in a company project on a voluntary basis (BiBB, 2017). According to the OECD (2016b), just a small fraction of the vocational courses is done in cooperation with partners from the world of work. It mentions the National Federation of Coffee Growers as one successful example of such a cooperation between the schools and companies where students have the opportunity to apply their skills. In addition, the SENA offers dual vocational education

⁹ Known as education for work and human development (EWHHD).

and training in five pilot projects. It does this in cooperation with the German Federal Institute for Vocational Education and Training (BiBB). The dual VET programs resemble the German dual VET system. The pilot projects are offered in the following five sectors: automobile, food, textile, and aircraft sector and in poultry farming (SENA & BiBB, 2016). In this dual VET system, school-based training in a SENA school is combined with training at an inter-company training centre and work-based training in a company. Students spend at least 50 percent of the time in the companies, but these are not allowed to employ them 100 percent of the time only in productive work. They have to provide the students with learning material and equipment, as well as specially trained staff who instruct the students. The instructors, who are usually skilled workers from the companies, are trained at the SENA during 80 hours (whereof 60 hours are classroom and 20 hours practical training). The examination of the students takes place in the SENA schools. Companies are not allowed to employ more than 30 trainees at the same time and have to pay them the minimum wage (BiBB, 2017). The goal of this dual VET initiative is to become the most common form of VET in the Colombian educational system. The 2015-2018 SENA Strategic Plan states that the model of dual Colombian VET should be further developed, institutionalised, and established at a national level by 2018 (ibid.).

In general, in case a student opted for the practical training in a company, he/ she would be employed on a training contract. Companies with more than 15 employees have to employ trainees and are obliged to pay two percent of their wage costs to the SENA as a levy grant. This is a prerequisite for that a company can offset its salary costs against corporation tax. The training contract obliges the companies to pay their trainees a monthly salary. Its level is tied to the unemployment rate: if it is at or above 10 percent, the companies have to pay their trainees 75 percent of the minimum wage during practice periods in the company and 50 percent when the trainees are at school. If the unemployment rate is below 10 percent, companies have to pay their trainees the full minimum wage (BiBB, 2017).

Testing the quality of skills taught in the vocational pathway against those provided by the general education pathway provides mixed results. An analysis of the SABER 11 test results¹⁰ shows that students participating in vocational courses provided by the SENA or tertiary education institutions, perform more poorly than students in general education programs. However, this could be due to the fact that normally, an over-proportional number of low-skilled students with a weak social economic background enrolls in the vocational pathway. The fact that the differences in outcomes between students in the general and vocational education pathway are lower in rural areas could be a further confirmation of such a selection effect. In rural areas, vocational schools are often the only providers of upper secondary education. Assuming that the students' abilities do not differ systematically between rural and urban areas, students in rural areas cannot self-select into the different pathways as easily as students in urban areas (due to the constrained supply of schools offering the general education pathway). On the contrary, other studies show that students participating in vocational courses provided by the SENA or tertiary education institutions are more likely to proceed to higher/tertiary education (OECD, 2016b).

Though the information about the labour market outcomes of former VET students is limited, the scarce evidence suggests that the quality and success of the programs varies across schools and regions. Besides the quality of students, also the low employer engagement and lack of nationally specified occupation-specific qualification standards (national qualifications framework) are responsible for the rather low quality of Colombia's VET sector. Some sources indicate that VET students have a hard time finding a formal job or to continue in further education with the skills learned at school (OECD, 2016b). However, not only the low skills of the workers, but also other factors such as high labour costs make it general hard for youngsters to find a job in the formal labour market.

¹⁰The SBER 11 test is a standardized exit exam for graduates of the 11th grade provided by the Colombian Institute for the Evaluation of Education (*Instituto Colombiano para la Evaluación de la Educación*, ICFES).

Non-formal vocational education

The SENA also provides non-formal VET programs organized in four semesters. These are for students who did not complete upper secondary education (EP-Nuffic, 2015b). These certificates are at the level of the upper secondary degree (*Bachillerato*) and give access to the professional technician programs at the tertiary education level. The programs last four semesters; however, a certificate of occupational skills can be attained after one year already (UNESCO-UNEVOC, 2013).

In 2006, the term “non-formal education” in the General Law of Education was replaced with the term “education for work and human development (EWHI)”. The EWHI programs are free of charge, prepare for the labor market and end with certificates of occupational proficiency. Under the lead of the SENA, the National System of Education for Work (SNFT) is responsible for the standardization, evaluation and certification of work competencies, and for establishing an education system based on work competencies. The SNFT enhances the recognition of prior learning and thereby the connection between the formal and non-formal education system. The SNFT is operationalized through two bodies: the SENA, which standardizes and approves work competencies, and sectoral divisions, which propose policies to support the educational development of the workforce and the development of a national qualifications framework (UNESCO-UNEVOC, 2013).

2.3.3 Professional education and training (PET)

There are four different professional education and training (PET) degree programs: two at the undergraduate level and two at the graduate level.

One of both undergraduate programs leads to the degree Professional Technician (*Técnico Profesional*), which aims to equip students with the skills that are needed to successfully exert a specific profession. The majority of these programs is associated with practical professions. The curriculum focuses on practical skills and specialized theoretical knowledge rather than general education. The minimum entry requirement to this program is the *Bachiller* (upper secondary level completion certificate). In addition, students must have a certain number of points in the standardized test SABER 11 provided by the ICFES. Applicants, who are at least 16 years old and have a certificate of occupational or professional aptitude (*Certificado de Aptitud Ocupacional/Profesional, CAP*) from the SENA, and have at least two years of work experience, can also enter the program. Graduates can either progress to study in a technological program or enter the labor market (IQAS, 2010).

The other program at the undergraduate level is the degree Technologist (*Technológico*). It puts more emphasis on scientific and theoretical knowledge. Most often, it is offered in the following fields: business, management, engineering technology and communications. Students learn how to design, implement and manage processes involved in their profession. For admission, students need a *Bachiller* and a certain number of points in the SABER 11 test. It is also possible to enter this program after having completed the Professional Technician degree. Then, getting the title of a Technologist only takes one and a half instead of three to four years to complete. Students who were granted the degree Technologist can enter university to achieve the Licentiate (*Título Profesional/Licenciado*), which is equivalent to the Bachelor degree. Then, the Bachelor takes only one and a half instead of four to five years to complete (ibid.).

One of the graduate degree programs is the Professional Technical Specialist (*Técnico Profesional Especialista*). It allows students to explore a specific area of their field of study in more detail. Most common are the following fields: finance, management, agriculture and technology-related professions. The entry requirement to this program is the degree Professional Technician. After this program, most graduates enter the labour market (ibid.).

The other graduate degree program is the Technological Specialist (*Technologico Especialista*), which gives students the opportunity to specialize in their field of study. Most of these specializations are offered in the fields: business management, commerce, finance, technology and communications. The entry requirement to this program is the degree Technologist. Graduates can continue their studies at a university or enter the labour market. Holding the degree of a Technologist and a Technological Specialist is regarded as equivalent to holding a general education bachelor degree (ibid.).

PET is offered by different providers, which will be introduced in the following.

First, professional technical institutions (*Instituciones Profesionales Tecnicas*) mostly offer higher technical and vocational programs with a strong practical orientation. These institutions are:

"Legally empowered to offer training programmes in occupations of an operational and instrumental character and of specialisation in their respective field of action, without prejudice to the humanistic aspects of this level" (Law 30 art. 17, 1992). (SENA & BiBB, 2016).

At the undergraduate level, these institutions offer the Professional Technician degree, which lasts two to three years and the Professional Technical Specialist at the post-secondary level, which takes one to one and a half years to complete (Immerstein S. , 2015).

Second, technological institutions (*Instituciones Tecnologicas*) offer the same degrees, though the programs last a little longer. The degree Technologist lasts three to four years and the Technological Specialist takes one to two years to complete (ibid.). The technological institutions are:

"Faculties which carry out training programmes for occupations, academic training programmes for professions or disciplines and specialisation programmes" (Law 30 art 18, 1992). (SENA & BiBB, 2016).

Third, universities or university institutions also provide PET.

Lastly, besides these institutions, the SENA also offers programs at the undergraduate level leading to the degree Professional Technician and Technologist (IQAS, 2010). As mentioned earlier, students can participate in company-based practical placement or be involved in a company project on a voluntary basis as part of their training provided by the SENA. The duration of the practical training in SENA's *Técnico Profesional* program is 12 to 15 months, equivalent to a total of 1600 to 2000 training hours. Practical training for the *Technologico* lasts about 24 months (3200 hours) (BiBB, 2017).

2.3.4 Key actors in the Colombian VPET system

Government

The details explained in the following refer to Colombia's VET and PET system equally. The responsibility for the education system is shared between the Ministry of National Education (*Ministerio de Educación Nacional*, MEN) and the Certified Territorial Entities (*Entidades Territoriales Certificadas*, ETCs) (OECD, 2016b). Each ETC is led by a Secretary of Education and an education development plan (*Plan de Desarrollo para la Prestación del Servicio Educativo*, PED). The ETCs are in charge of the development and implementation of education policy, quality assurance and provision of education at public and private schools, and the support of non-certified municipalities. In 2015, there were 95 ETCs (ibid.).

The MEN is the main actor in the Colombian education system. It establishes regulations and develops guidelines including learning objectives and subject areas for all education levels (Immerstein S. , 2015). Further, the MEN also inspects and evaluates the quality of the education system. As advising and

supporting agents the MEN has the National Council for Higher Education (*Consejo Nacional de Educación Superior, CESU*), the National Inter-Sectorial Commission for Higher Education Quality Assurance (*Comisión Nacional para el Aseguramiento de la Calidad de la Educación Superior, CONACES*) and the National Accreditation Council (*Consejo Nacional de Acreditación, CAN*) (EP-Nuffic, 2015b; OECD, 2016a). The CESU consists of members from academia, business, science, and public agencies (OECD, 2016b).

Each of Colombia's 32 departments has a Secretariat of Education. These administer the education system at the regional level and control that the schools and institutions implement the regulations and guidelines of the MEN (Immerstein S. , 2015). In addition, the secretariats have the duty to create VET institutions at the upper secondary level, thereby considering the local needs and the available resources (OECD, 2016b).

Employer engagement

Employer engagement in Colombia's VPET system remains low. As mentioned in the previous section, companies with more than 15 employees have to take on trainees, which creates some kind of interaction of companies with the training sector. In addition, the SENA started a pilot project of offering dual VET in cooperation with companies.

The *National System of Education for Work (Sistema Nacional de Formación para el Trabajo, SNFT)* was developed to improve the Colombian VPET system and to strengthen its ties with the labor market. It is meant to be an actor

"(...) that oversees and combines companies, associations, education and technological development centers, technical and professional educational institutions, and the state in order to define and implement policies and strategies addressed to the continuing development and qualification of the national work force." (UNESCO-UNEVOC, 2013).

Under the lead of the SENA, the SNFT is responsible for the standardization, evaluation and certification of work competencies, and for establishing an education system based on work competencies. By enhancing the recognition of prior learning, the SNFT strengthens the connection between the formal and non-formal education system. It is composed of two bodies: the SENA, which standardizes and approves work competencies, and sectoral divisions, which propose policies to support the educational development of the workforce and the development of a national qualifications framework (ibid.).

Education and training providers

The key actor on the side of the training providers is the SENA, which was created in 1957. It is part of the Ministry of Labour (UNESCO-UNEVOC, 2013). It is the largest provider of formal VPET programs (upper secondary and tertiary level) and non-formal education (EWHD) (ibid.). In the board of directors and its technical committee, representatives of employers and trade unions are present. The SENA is also responsible for operating the National System of Education for Work (SNFT) (see further below for more info) (ibid.). The SENA provides 70 percent of technical training and technological education at the tertiary level. In addition, its importance to deliver vocational education at the upper secondary level has been growing over time: here, it provides about 50 percent of all vocational courses. The SENA is autonomous in managing its funding and to decide about its own policy and regulation (OECD, 2016b).

According to the (OECD, 2016b), tertiary education institutions have started to provide vocationally oriented courses since the introduction of the Programme for Strengthening Technical and Technological Education (*Programa de Fortalecimiento de la Educación Técnica y Tecnológica*) in 2006.

In general, the schools and institutions providing VPET have a large autonomy with respect to national and local governments, also because there is no national qualification system. They are free within the MEN guidelines to create educational programs, specify study plans, set admission requirements, grant degrees, and select teachers (Immerstein S. , 2015; OECD, 2016a). Besides, these schools and institutions are responsible for establishing relations to the labour market (OECD, 2016a).

2.4 Peru

Peruvian students complete lower secondary education at the age 13 or 14. The results of the Peruvian students in the 2012 PISA study, which tests the scholastic performance of 15-year-old students in mathematics, science, and reading in 65 countries, is with an average score of 375 points far below average (in 2012; OECD, 2014).

Peru has data for four out of 12 KOF YLMI indicators (2012; KOF Swiss Economic Institute, 2016; Renold, Bolli, Egg, & Pusterla, 2014), thus we interpret the following comparison with caution. Peru's KOF YLMI is 4.6, which is higher than the Latin American average of 4.4, but lower than the value for Switzerland (5.88). Both indicators suggest that Peru has room for improvement in its education system.¹¹

2.4.1 The Peruvian education system

The Peruvian education system consists of two main education levels: basic education (*educación básica*) and superior education (*educación superior*; MINEDU & CNE, 2010). The basic education level is compulsory and extends over early childhood education to upper secondary education, overall 12 years. Public and private schools follow the same curriculum, which are set by the federal education authorities, but only the attendance of public schools is free of charge (Clark, 2015). The superior education consists of university and non-university education (MINEDU & CNE, 2010). The official instruction language on all education levels is Spanish, with some exceptions in regional primary schools, where teachers teach in Aymará or Quechua (Clark, 2015).

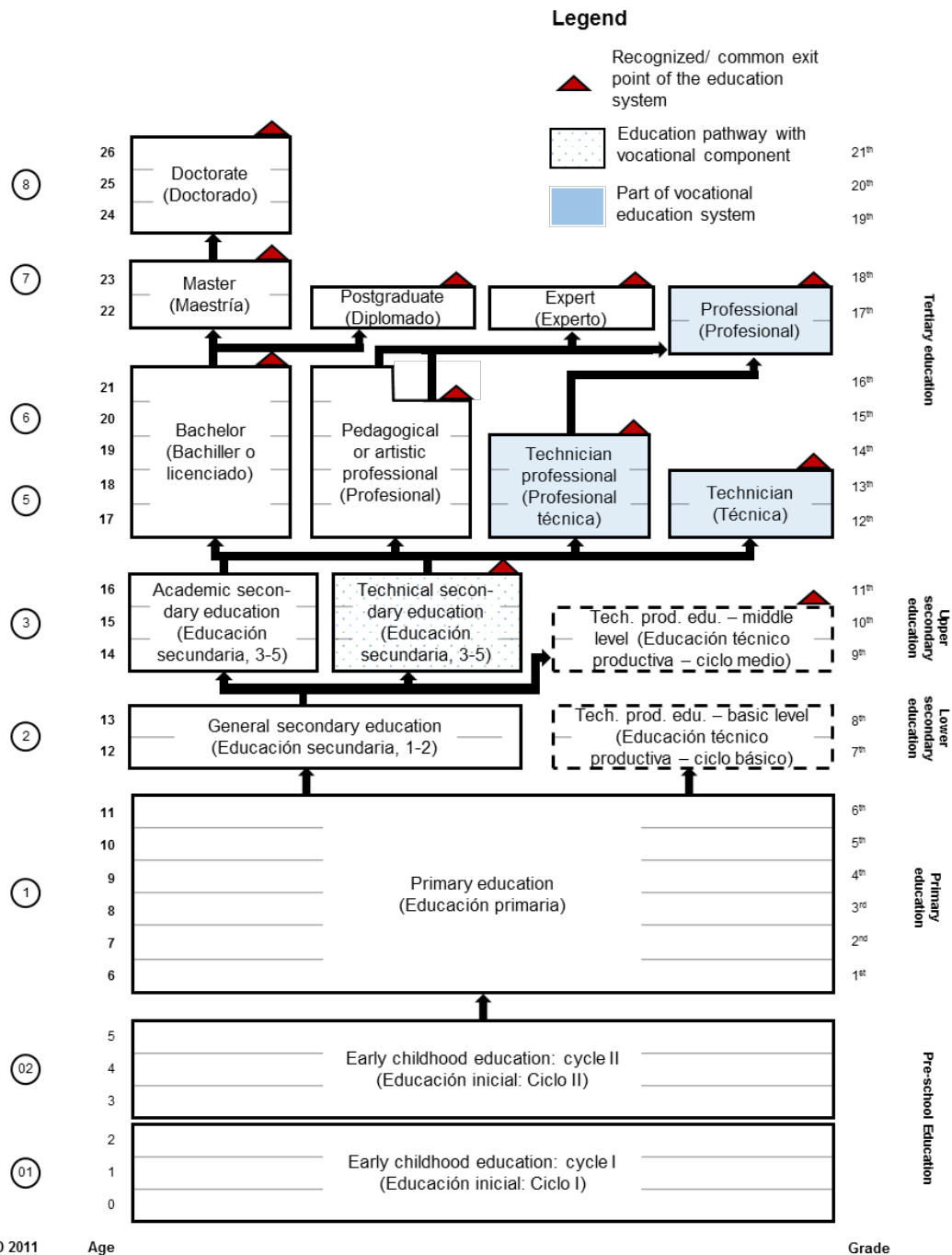
In Peru, children start compulsory education at the age of five, when they enter pre-school education for one year. The enrolment rate of five year olds was 95 percent in 2014 (INEI, 2016). Thereafter, they attend six years of primary education, followed by five years of secondary education. Secondary education consists of lower secondary education and upper secondary education. Lower secondary education lasts two year, whereas upper secondary education lasts three years. The latter consists of two different pathways, an academic and a vocational education and training¹² (VET) pathway. The latter is further divided in programs provided at so-called *Colegios Técnicos* and programmes provided by so-called *Centros de Educación Técnico-Productiva* (CETPROs).

The enrolment rate into primary education is 92 percent whereas the enrolment rate into secondary education is 83 percent (2014; *ibid.*). About one third of students enrolled in secondary education follow the VET stream (Clark, 2015). Roughly one third of young Peruvians aged 18 to 19 have not achieved a secondary education degree, which is needed to apply at a higher education institute (McCarthy & Musset, 2016).

¹¹ All the information in this case study taken from the KOF Education System Factbook: Peru (KOF, forthcoming)

¹² In Peru, the vocational education and training programmes are called technical secondary education.

Figure 4: The Peruvian education system¹³



Source: Own illustration based on the data of the UNESCO (2016b), Clark (2015) and MINEDU & CNE (2010).

At the tertiary education level, young Peruvians with a secondary school certificate have the choice to enrol in a university or a non-university institute, after passing the institute's entrance exam. At university, students aspire a bachelor degree, which opens the door to a postgraduate degree or a Master degree, the latter providing access to a doctorate (UNESCO-UIS, 2016b). At a non-university institute (*Institutos de Educación Superior Tecnológico*, IEST), students may choose between pedagogical/artistic professional education, technician professional education, and technician education (Clark, 2015).

¹³ The size of the boxes does not coincide with the actual size or importance of the program in the education system.

On top of the pedagogical/artistic professional education, students can add a so-called expert degree of professional education, whereby students with a technician professional education have access to the latter programs well. Figure 4 gives an overview on the entire Peruvian education system and its connecting transition paths.

2.4.2 Vocational education and training (VET)

After the completion of primary education, students continue with the two years of lower secondary education, which is a general education program, i.e. with no vocational education. In general, Peru's VET system at the upper secondary level is not very well developed. After the two years of lower secondary school, students can choose whether they want to continue their studies in the general education (*Centro Educativo/Colegio –Ciclo Científico-Humanístico* (BQ-Portal, 2017) or vocational pathway (*educación para el trabajo*). The latter is offered by a small group of vocationally oriented upper secondary schools (so-called *Colegios Técnicos*) (McCarthy & Musset, 2016) or so-called open access training centers, *Centros de Educación Técnico-Productiva* (CETPROs). Even though the open access training centers belong to the formal education system—since they provide officially recognized degrees and are subordinated to the Ministry of Education—they are somehow disconnected from the rest of the education system, as the awarded degrees do not allow students to progress to higher education (McCarthy & Musset, 2016).

Both, the general and vocational pathway take three years to complete and provide access to higher education. However, the majority of students directly enters the labour market (only about 40 percent progress to higher education). While the general education pathway terminates with the degree *Certificado Oficial de Educación Secundaria Común Completa*, students completing the vocational program are granted the *Diploma de Aptitud Profesional/Auxiliar Técnico* (BQ-Portal, 2017).

In the following, we will first refer to vocational education at secondary schools and then to that offered by the open access training centres.

VET at secondary schools

A small group of vocationally oriented upper secondary schools (so-called *Colegios Técnicos*) offers a vocational specialization (McCarthy & Musset, 2016). Pupils choosing this vocational specialization had the opportunity to opt for one of the following fields: agriculture, crafts, trade, industry, mining, tourism and health. However, recent educational reforms reduced the number of hours vocationally oriented upper secondary schools could spend for vocational education and increased that for general education. As a result, little or no difference between these vocationally oriented and general education programs remains (McCarthy & Musset, 2016). Some sources say that this alignment of programs reduced the amount of time that could be dedicated to vocational education to two hours a week- for both, vocationally oriented and general education schools (EP-Nuffic, 2015c). The main reason for these reforms was the poor quality of the vocationally oriented schools. In order to remedy the quality shortcomings of these programs, the government decided to apply the same requirements to the diplomas of the vocationally oriented schools as to the general education diplomas.

VET provided by open access training centres

Besides the vocational programmes described in the previous section, students can enrol in open access schools, so-called *Centros de Educación Técnico-Productiva* (CETPROs). The General Education Law (Law N°28044) established the CETPROs, which replaced the former Occupational Education Centres (CEO) (Lavado, Rigolini, & Yamada, 2015).

The CETPROs offer adults, young people and persons with special needs the opportunity to acquire competences for the labour market and for the pursuit of special professional activities. In addition to providing training for the labour market, the CETPROs offer continuing education and training, as well as training for the unemployed (Schönstedt-Maschke, 2014).

CETPROs offer two different short-cycle training programs: the basic cycle (*Ciclo Básico*) and the middle cycle (*Ciclo Medio*). While the former lasts between two months to one year, the latter takes two years to complete (McCarthy & Musset, 2016).

Most of the basic cycle courses are offered in trades and professions in the textile industry. To be admitted to a basic course, no previous knowledge is required. Consequently, this program provides training opportunities for people with a primary education degree or those who have no formal school-leaving certificate. The courses are free of charge in the public institutions, which provides qualification possibilities for persons with low incomes. After one year, the students are awarded the degree “assistant technician”. The one-year degree shall equip students with the necessary skills for the execution of minor complexity activities, helping them to transition into the labour market. In order to be admitted in a two-year middle cycle course, a secondary school diploma is necessary (after completing the first two years of secondary school) (ibid.). The two-year program trains students for a specialized occupational activity, enabling them to receive a technical degree, the so-called “technician” degree (Lavado, Rigolini, & Yamada, 2015).

The basic cycle training courses at CETPROs are mostly introductory seminars. Most of the one and two year courses are taught with simple devices, since the teaching equipment and infrastructure is very poor. Thus, students lack work experience with devices used in the real workplace. Since a large number of the private CETPROs are profit-oriented companies, it is crucial for them to save costs in the short term. For example, they refrain from analysing whether the skills they teach meet the demand of the labour market. The consequence is that many curricula are outdated, as they are not adapted to the ever-changing conditions of the labour market (Schönstedt-Maschke, 2014).

Due to its low entry barriers, the CETPROs are a good alternative for young Peruvians who dropped out of school or somehow did not manage to finish secondary school. School dropouts have been a problem in Peru since a long time. Despite improvements in the past, around one third of the Peruvians aged 18 or 19 have not completed secondary school. In this regard, many CETPRO-students come from families with low socioeconomic status (McCarthy & Musset, 2016; Lavado, Rigolini, & Yamada, 2015).

There are more than two thousand such centres in Peru. The majority of CETPROs are private.¹⁴ In 2014, 244 694 students were enrolled in CETPRO programs. More than half of these were enrolled in private institutes. Thereby, the tuition and fees between the CETPRO vary widely (McCarthy & Musset, 2016). Since private CETPROs do not receive public funding, they are dependent on the tuition and fees of the students. Consequently, they often deliver programs in subjects that are demanded by the students (e.g. hair dressing, secretarial skills) but not necessarily on the labour market (with an over-demand for people with technical skills), leading to a skills mismatch. In fact, one problematic aspect of the Peruvian VET system is the poor alignment of education programs with the needs of the labour market. In particular, there is an under-supply of professionals with a scientific or engineering degree and an over-supply of people with a degree in administration or accounting. In addition, national and

¹⁴ The education provider in the manufacturing sector, *Servicio Nacional de Adiestramiento en Trabajo Industrial* (SENATI) (see next subsection for more info), runs some of the CETPROs in this sector. To be admitted in one of the SENATI schools, a secondary school leaving qualification is a prerequisite (Schönstedt-Maschke, 2014).

international actors (e.g. the OECD) have questioned the quality of the training programs (McCarthy & Musset, 2016; Lavado, Rigolini, & Yamada, 2015).

The Ministry of Education (MINEDU) regulates the CETPROs. It gives them the authorization to grant degrees and develop their own curricula. Though the CETPRO programs belong to the formal education sector, they have no formal connection to the secondary school system (McCarthy & Musset, 2016). Since the end of 2016, the law N° 30512 (*Ley de Institutos y Escuelas de Educación Superior y de la Carrera Pública de sus Docentes*) grants students with the certificate of a “technician” (having completed the middle cycle) issued by a CETPRO the opportunity to access programs at the post-secondary education level at so-called Institutes and Schools of Higher Technological Education (IESTs). This is only possible if the IESTs recognize the “Technician” certificate. However, the large number of training programs with a diffuse range of specialization opportunities and the absence of a uniform training regulation, provides that the programs of the CETPROs are very heterogeneous. This makes the transition of graduates to the higher education system almost impossible (Schönstedt-Maschke, 2014).

One example of the diffuse situation on the training market is that CETPROs as well as higher education programs at IESTs (see next subsection for a description of the IESTs) grant the certificate of a “Technician” (McCarthy & Musset, 2016).

As a consequence of the low amount of VET programs offered at the upper secondary education level, paired with the fact that many Peruvians do not enrol in tertiary education (only around 40 percent of a cohort), many young Peruvians enter the labour market rather unprepared (McCarthy & Musset, 2016).

2.4.3 Professional education and training (PET)

Compared to the VET system, Peru’s professional education and training (PET) system is much more elaborated and integrated in the Peruvian education system (McCarthy & Musset, 2016). Upon completion of upper secondary school, students who decided for a vocational degree have access to a wide range of programs. They can choose between programs offered by the Institutes and Schools of Higher Technological Education (*Institutos y Escuelas de Educación Superior Tecnológicos- IEST*) or those provided by sector-based institutions. Both types of institutions offer highly technical programs, such as auto repair and precision manufacturing, and less technical programs, such as business administration and graphic design (McCarthy & Musset, 2016). Both types of institutions will be described in more detail in this section.

Post-secondary education in general and the non-university sector in particular, is regulated by the laws N°29394 (*Ley de Institutos y Escuelas de Educación Superior*) and N°30512 (*Ley de Institutos y Escuelas de Educación Superior y de la Carrera Pública de sus Docentes*). According to these laws, the institutes and schools for higher education in the non-university sector can offer pedagogical, technological or artistic training; public or private providers can run the institutes (INEI, 2014).

PET provided by the IESTs

Students who decide to enrol in a program at an IEST can choose between two different qualifications. Either the two-year technical training (80 credits, around 2000 hours of instruction) leading to a Technician Certificate (*Técnico*). Or the three-year professional technical training (about 3000 to 4000 hours of instruction) leading to a Technician professional Certificate (*Profesional Técnico or Profesional*) or Technical Bachelor (*Bachiller técnico*) (WENR, 2015; Edugestores, 2017).

In 2014, 30 percent of all post-secondary students were enrolled in an IEST program. Since the liberalization of the education sector (through the *Decreto Legislativo 882*), the university but also the non-

university sector has expanded substantially through the establishment of private institutions. Consequently, private providers run most of the IESTs: in 2014, over the 70 percent of IEST students were enrolled in private institutions- even more than in the CETPRO sector where the corresponding share was 50 percent. Private schools do not receive financial aid from the government. Consequently, they depend primarily on tuition fees. The variation in fees is very high, they range from \$US100 to \$US8000 (McCarthy & Musset, 2016).

As in the VET sector, a general problem of the programs provided by the IESTs is their poor alignment with the needs of the labour market. According to the OECD (2016), there is an oversupply of graduates from less technical fields and an under-supply of graduates in scientific and technological fields. In addition, the transition between IEST programs and the university sector is difficult. Such a transition is often only possible if there is a large overlap of the program attended at an IEST with the university program and given that the respective student invests a lot of effort to convince the responsible persons. More often, students end up starting from scratch or repeating coursework (McCarthy & Musset, 2016).

The programs provided by sector-based institutions often guarantee a better alignment of the programs with the needs of the labour market. These will be described next.

PET provided by sector-based institutions

Some industry sectors, namely the construction, tourism, manufacturing, mining, telecommunication and defence sectors, have established their own technical schools providing training programs. These technical schools are largely independent from the MINEDU, have their own governance structures and finance schemes. They not only provide degree programs for youngsters, but also further training for the working population. The close collaboration with employers in- terms of financing and program design- reassures the alignment of the programs with the labour market needs. Though the schools account for only 10 to 15 percent of total enrolment in PET programs, they have a good reputation (McCarthy & Musset, 2016).

As mentioned in a report published by the *Banco de Desarrollo de América Latina (CAF)* (2015), these sector-based institutions also belong to the formal education sector.

An OECD report (2016) provides a short summary of three of these sector-specific schools. Unless otherwise indicated, this report is the main source for the information provided in the following.

Programs of the construction sector (SENCICO)

The *Servicio Nacional de Capacitación para la Industria de la Construcción* (SENCICO) provides initial and further training for the construction sector in schools located in the four biggest cities of Peru. The schools are private and develop their curricula independently. They are financed only through tuition fees and employer contributions. Nevertheless, the SENCICO operate under the jurisdiction of the Ministry of Housing. Compared to the 361,399 students enrolled in IEST programs in 2014, the number of 2,573 enrolled students (both in 2014) is relatively low.

Programs of the tourism sector (CENFOTUR)

The *Centro de Formación en Turismo* (CENFOTUR) caters two- and three-year training programs to the tourism sector, provided in four different schools. These schools are authorized by the Ministry of Trade and Tourism, but otherwise free to design their curricula according to the industry's needs. In addition, these schools are financed partly through tuition fees, partly through employer contributions. About 1,500 students enrol in the CENFOTUR schools every year.

Programs of the manufacturing sector (SENATI)

The *Servicio Nacional de Adiestramiento en Trabajo Industrial* (SENATI) provides two- and three-year training programs in 13 different areas with 31 training professions belonging to manufacturing sector (e.g. in machining, mechanical production, and repair technologies). The schools of the SENATI belong to the post-secondary, non-university sector. As such, the minimum entry requirement for all programs provided by the SENATI schools is a secondary school certificate (Schönstedt-Maschke, 2014).

International organizations, such as the OECD, have criticized the low quality of the Peruvian education system in general. In addition, quality differences within Peru seem to be present. Due to these quality differences, the SENATI decided to bring all trainees to a uniform level of basic skills. Before the start of the actual training program, each student has to go through a compulsory preparatory course (*Nivelación académica*). The preparation course ends with a test. Only the students who pass the test are admitted to start the actual training program (Schönstedt-Maschke, 2014).

Some of the training programs provided by SENATI schools are organized in a dual manner; others are completely school-based. The programs are classified in levels that correspond to their degree of complexity and variety of their productive tasks or functions, as well as the degree of autonomy and responsibility. While the dual program is located at the lowest level, the “operative technical level”, the other school-based programs are classified as “middle technical level” and “higher technical level”. By providing vocational training in a dual manner, the SENATI schools are unique in Peru (ibid.).

The dual training program lasts three years (3-6-semester). Therein, students spend their first year in school and the second and third year in the workplace under the guidance of a mentor (McCarthy & Musset, 2016). In the last two years, students work four days a week in the company and one day in professional education centres (*Centros de Formación Profesional*). The ratio of training spent in the workplace and training centres is 80 to 20 percent. In addition to vocational training, there are also four-week supplementary seminars (*Seminario de Complementación*), which ensure that all trainees have knowledge and skills with the most up-to-date technology, as modern technical equipment is missing in some companies (Schönstedt-Maschke, 2014).

Instructors teach the theoretical and practical basic and vocational training provided in the professional education centres. They must have a university degree and at least three years of professional experience in the professional field they teach (often, they are former SENATI students). Specialists supervise the in-company training. Their role is comparable to a “Meister” in the VET model in German-speaking countries like Switzerland. The instructors also have the task to undertake company visits and to support the in-company supervisors pedagogically and technically (ibid.).

The training companies that participate in the dual training can be divided into two groups. First so-called *Patrocinios*, where the company pays trainees a salary for the training period. These companies are obliged to pay the trainee at least 50 percent of the minimum wage. Thereby, the trainee has to pay his insurance costs himself. Second, companies that train, but do not provide compensation for the trainees. However, the trainees can apply for a fellowship (ibid.).

The SENATI is independent from the Ministry of Education in operating its schools and granting degrees. It runs 80 schools with 72,443 enrolled students in 2014. The schools are financed only through tuition fees and employer contributions from the industrial employer association (*Asociación de Empresas Industriales*) (McCarthy & Musset, 2016). For its dual training programs, the SENATI cooperates with about 9,500 companies spread all over Peru (ibid.).

The co-operation between SENATI and the company sector also covers other areas. The companies are involved in the management of SENATI and in the planning and development of the training curricula

(about 250 companies at country level). SENATI also recruits industry experts as teachers from the companies and consults companies regarding their training strategies. In cooperation with companies, the SENATI also offers the Employment Service (*Bolsa de Trabajo*), both for graduates of SENATI and for registered companies. In this way, graduates who have not found a job directly after their training can have their profile and application submitted, but also the companies can benefit from the exchange if they want to fill vacancies with qualified specialists (ibid.).

2.4.4 Key actors in the Peruvian VPET system

The key actors administrating or operating the Peruvian VPET system are briefly described in the following.

Government

In Peru, the Ministry of Education (*Ministerio de Educación del Perú*— MINEDU) is the main actor in the entire education system, i.e., from pre-school to university. The MINEDU sets the education policy, and develops the legislation. It designs the curricula for the VET system. In the PET system, the MINEDU regulates the institutes, but sets neither the curricula nor the degrees, which is the privilege of the respective institutes. The local education authorities are responsible for the implementation of the education policy and supervision of the compulsory education.

Operationally, the MINEDU has 26 Decentralized Regional Governments (*Dirección regional education-DRE*), together with 17 decentralized Local Education Management Centers (*Unidad de Gestión Educativa Local- UGEL*). These official bodies act at the regional level. Therefore, they are better informed about the needs of the local education systems. Their main task is to supervise the alignment of the curricula in the local education institutions with the nationally prescribed minimum requirements for curricula (McCarthy & Musset, 2016).

The sector-based institutes, on the other hand, have their own governance structures and financing strategies, making them mostly independent of the MINEDU (McCarthy & Musset, 2016).

Part of the MINEDU is the Vice Ministry of Pedagogic Administration (VMPA). A subsidiary of the VMPA is the General Direction of Superior Education and Professional Technicians (*Dirección general de educación superior y técnico profesional- GDSEPT*). This department is responsible for both, public vocational programs at the secondary and post-secondary level. Its responsibilities lie in the design of basic curricular structures and the regulatory framework for the VPET system in CETPROs and IESTs. The GDSEPT sets rules at the national institutional level (MINEDU, 2015).

Together with the MINEDU, the Ministry of Labour (*Ministerio de Trabajo y Promoción del Empleo- MTPE*) is responsible for the training provided by CETPROs. In addition, it is responsible for other vocational training programs, such as job training, employment services and active labour market programs (CAF, 2015).

Collaboration between the MINEDU and the MTPE in the public VPET sector is scarce. As the MINEDU mainly focuses on the general education programs at the secondary education level, this gives little room for improvement and collaboration with the MTPE regarding the VET system (Sociedad de Comercio Exterior del Perú, 2014). According to the OECD (2016c), a closer collaboration of the MTPE and the MINEDU would be favourable. The MTPE recently launched three sector skills committees. These committees serve as forums for dialogue and collaboration across ministries, among others the MINEDU, and with employers (ibid.).

In 2011, the MTPE launched a service for recognition of prior learning for workers from certain fields by giving a number of skill certifying institutions, such as schools, industry associations or local job centres, the authority to award official qualifications. The participants pay a small fee for this service. Regarding the high level of informality in the labour market, this service enhances the transition from the informal to the formal employment sector (McCarthy & Musset, 2016).

In 2016, a new law (N°30512) regulating technical institutions in the higher education sector was passed. Among other things, it established a new body responsible for the planning and management of the national network of technical institutions in the higher education sector, the so-called Office of Management of Institutes and Schools of Higher Education (*Organismo de Gestión de Institutos y Escuelas de Educación Superior Tecnológica Públicos*- EDUCATEC). EDUCATEC is attached to the MINEDU, with functional, economic, budgetary and administrative autonomy for the exercise of its functions. It operates at the national level to support the development and establishment of public technical higher education. It does so in close coordination with regional governments (Edugestores , 2017; McCarthy & Musset, 2016).

Employer engagement

The industry institutes on the other hand have own governance structures and financing strategies making them mostly independent of the MINEDU. In addition, in the VPET system there is as well collaboration with the MTPE and efforts to include other stakeholder such as employers are ongoing (McCarthy & Musset, 2016). In general, employer engagement in the Peruvian education system is most probably the highest in the sector-based programs, which make up only a small share of the overall system.

Education and training providers

a) Vocational Education and Training

Besides the vocational schools, the CETPRO are the main VET institutions at the lower secondary level. They form the curricula in accordance with their local representatives of the UGEL or DRE. The CETPRO are meant to be flexible, so that the educational services respond to the heterogeneity of the students and stands in context to their peculiarities (MINEDU, 2004).

b) Professional Education and Training

PET is offered by the IESTs the sector-based programs that are organized independent of the MINEDU. The sector-based programs make up only a small proportion of the sector (10-15 percent), while the majority of programs is offered by the IESTs. They enjoy a good reputation among employers and students. Examples and large operators within this category are education programs offered by the following providers (McCarthy & Musset, 2016; CAF, 2015):

- *Servicio Nacional de Capacitación para la Industria de la Construcción (SENCICO)*
- *Servicio Nacional de Adiestramiento en Trabajo Industrial (SENATI)*
- *Centro de Formación en Turismo (CENFOTUR)*
- *Centro de Formación Técnica Minera (CETEMIN)*
- *Instituto Nacional de Investigación y Capacitación de Telecomunicaciones (INICTEL)*

However, also the defence sector offers such programmes.

Representation and advisory bodies

The main advisory body is the National Council of Education (*Consejo Nacional de Educación*- CNE). It is part of the MINEDU but operates autonomously and includes several stakeholders of the education system. Their main objective is medium and long term education planning. Its current members include

representatives from important industry sectors, teachers, the MINEDU and the MTPE. This advisory body is influenced and informed by many non-governmental education stakeholders (Consejo Nacional de Educación, 2017).

Furthermore, the National System of Evaluation and Accreditation of Educational Quality (SINEACE) is in charge of the certification of competencies of those completing programs in IEST. These certificates are also applied to a number of graduates of CETPRO (OECD, 2016c).

3 SWOT analysis of the VPET systems in the four PAC

Based on this very short and superficial analysis it is only possible to give a first impression about the strengths, weaknesses, opportunities and threats of the four VPET systems. We use the following criteria to compare:

- **Governance/Education-Employment Linkage Intensity:** Power equilibrium between actors from the education and employment system. The higher the optimum of power sharing between actors from the education and employment system the better.¹⁵
- **Training approach and workplace-training (WPT):** School-based versus combined school-workplace-based training. The higher the combined school-workplace-based training the better.¹⁶
- **Permeability:** System approach with clear progression routes throughout the whole education system. The more progression routes the higher the attractiveness of the VPET system.
- **Youth Labour Market Outcomes:** The higher the labour market outcomes based on KOF Youth Labour Market Index, the better the system performance.¹⁷
- **Equity:** All students—independent of their socio-economic background—get equal access to all programs.¹⁸

The following table consists of a short judgement based on the descriptive analysis. It is not fully evidence-based and depends on the available literature. The abbreviations stand for: S=Strength; W=Weakness; O=Opportunity; T=Threat.

¹⁵ For more information see: Renold, U., T. Bolli, J. Bürgi, K. Caves, M. Egg, J. Kemper and L. Rageth (2016): Feasibility Study for a Curriculum Comparison in Vocational Education and Training, Education-Employment-Linkage Index, KOF Studies, No. 80, Zurich, July.

¹⁶ OECD (2015): OECD Statistics, available at <http://stats.oecd.org/>

¹⁷ Renold, U., T. Bolli, M. Egg and F. Pusterla (2014): On the Multiple Dimensions of Youth Labour Markets, KOF Studies, 51, Zurich, August 2014.

¹⁸ Klieme, Eckhard, Hermann Avenarius, Martin Baethge, Hans Döbert, Heinz-Werner Hetmeier, Gisela Meisterscheufelen, Thomas Rauschenbach, and Andrä Wolter (2006). "Grundkonzeption der Bildungsberichterstattung in Deutschland." Zeitschrift für Erziehungswissenschaft. Bildungs- und Sozialberichterstattung. Beiheft 6. 129-145.

Table 1: SWOT analysis of the VPET systems in the PAC

Country	Mexico	Chile	Colombia	Peru
Criteria				
Governance (Government-Industry equilibrium)	S Cooperation between the Ministry of Education and the Ministry of Labour S Employer representation at state level (CEPPEMS)	S	S	S
	W Decision-power lies mostly at the education-side	W No strong cooperation available	W No strong cooperation available	W No strong cooperation available
	O Use already established ties to the labour market and intensify them	O Employer engagement must be established	O Employer engagement must be established	O Use already established ties to the labour market that exist in some sectors and intensify them, increase their scope
	T The risk is available that the results on the youth labour market deteriorate	T The risk is high that the results on the youth labour market deteriorate	T The risk is high that the results on the youth labour market deteriorate	T The risk is high that the results on the youth labour market deteriorate
Training Approaches and Workplace-Training (WPT)	S VET present in the education system from an early stage on	S	S	S
	W Mostly school-based approaches	W Almost fully school-based approach	W Almost fully school-based approach	W Almost fully school-based approach, some sector-based dual VET programs
	O Dual VET exists to some extent and could be developed; Foreign countries are eager to support dual VET	O Combined school-WPT approaches should be developed	O Combined school-WPT approaches should be developed	O Dual VET exists to some extent in some sectors and could be developed
	T Many little projects going on	T Upper secondary VET has no attractive WPT due to wrong incentives for students	T SENA provides non-formal; unclear recognition by educational authorities	T CETPROs offer formal education → unclear recognition by educational authorities

Country	Mexico	Chile	Colombia	Peru
Criteria				
Permeability	S Vertical permeability mostly in place	S	S Progression routes seem to be established at least for some programs	S Progression routes seem to be established at least for some programs (in the future)
	W Horizontal permeability not well established	W Not very well established, no national standards; tertiary level institutions play a major role	W Unclear permeability between programs on the tertiary level	W
	O Set exit or entrance standards at all education level to accredit previous experience	O Defining exit and entrance standard at all education level	O Defining exit and entrance standard at all education level	O Defining exit and entrance standard at all education level
	T No clear progression routes produces dead ends	T No clear progression routes produces dead ends	T No clear progression routes produces dead ends	T No clear progression routes produces dead ends
Youth Labour Market Outcomes (Quality of program in line with labour market)	S Leader among the four PAC and above Latin American average	S Higher than Latin American average	S	S Higher than Latin American average
	W Only 3 indicators out of 12	W Only 2 indicators out of 12	W Only 4 out of 12 indicators, lower than Latin American average	W Only 4 out of 12 indicators
	O Improving data set together with ILO to get a holistic picture about quantity and quality on the youth labour market	O Improving data set together with ILO to get a holistic picture about quantity and quality on the youth labour market	O Improving data set together with ILO to get a holistic picture about quantity and quality on the youth labour market	O Improving data set together with ILO to get a holistic picture about quantity and quality on the youth labour market
	T Setting wrong goals for reforming education system based on missing indicators	T Setting wrong goals for reforming education system based on missing indicators	T Setting wrong goals for reforming education system based on missing indicators	T Setting wrong goals for reforming education system based on missing indicators

Country	Mexico	Chile	Colombia	Peru
Criteria				
Equity	S	S	S	S
	W No analysis done	W Big equity issue due to high percentage of private schools	W No analysis done	W No analysis done
	O	O Should be addressed by establishing 15 public CFTs	O	O
	T Not addressing the topic does not improve attractiveness of the VPET system	T Not addressing the topic does not improve attractiveness of the VPET system	T Not addressing the topic does not improve attractiveness of the VPET system	T Not addressing the topic does not improve attractiveness of the VPET system
Summary	Emerging dual VET system; leader among PAC, but weak cooperation between government and industry, little information on the labour market outcomes and equity	Focusing on another goal: equity; weak improvement in VET; cooperation between government and industry does not exist	School-based VET approach; cooperation between government and industry does not exist (except five pilot projects)	School-based VET approach; cooperation between government and industry does only exist in some sectors

4 Improving evidence and developing strategies for VPET

4.1 Improving evidence

As mentioned at the beginning of this report, this descriptive analysis is only a starting point on a long road of gathering evidence regarding strengths and weaknesses of the VPET approaches within the four PAC. All countries should work on improving their collection of international comparable data sets.

Some examples:

- Outcomes on the youth labor market (e.g. completing dataset as indicated in the KOF Youth Labor Market Outcome Index (Renold, Bolli, Egg, & Pusterla, 2014).
- Identifying Education-Employment Linkage Index along all VET programs and compare it with the international benchmark systems to improve alignment with the needs on the labor market (Renold et al. 2016).
- Introducing a statistical variable (identifier) to follow career paths of students within the whole education system to identify progression routes and measure permeability
- Establishing a monitoring system to observe success factors and barriers of implementing a VPET strategy

Organizing such datasets is very time-consuming and must be considered a long-term goal. However, it will be a necessity to establish a pathway to impact.

4.2 Developing strategies for VPET

The very short SWOT analysis above gives a first insight where reforms could start. However, reforming the VPET system in a consistent way must be based at least on:

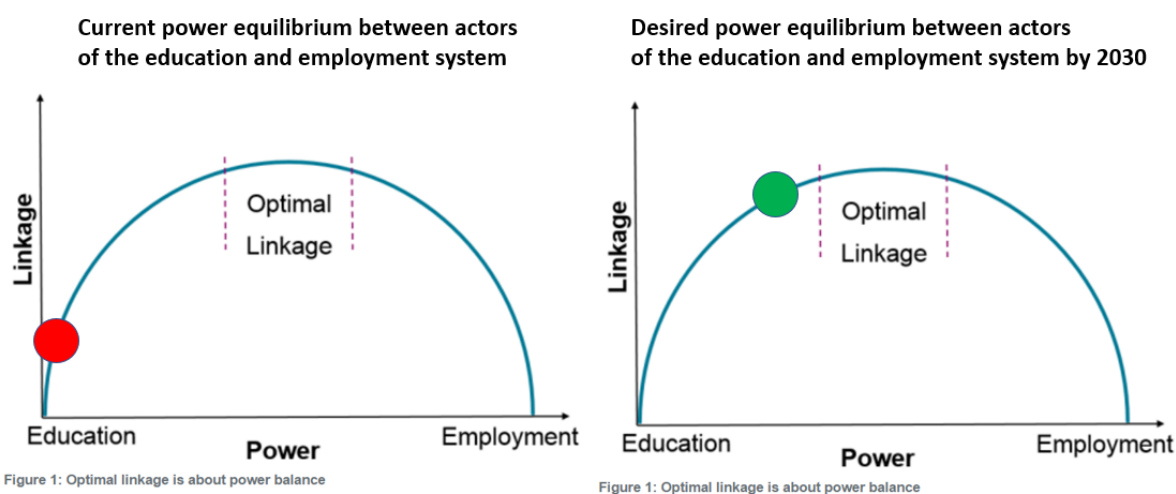
- A more profound analysis of strengths, weaknesses, opportunities and threats.
- A governance approach based on commitment among stakeholders from the education and employment systems. This is of paramount importance.
- A clear strategy regarding the structure of the education system (such as VET or PET programs), how to secure the volume of skills needed on the labor market qualitatively and quantitatively, goals regarding VET/PET enrolments rates, clearly defined permeability, strategies for addressing equity issues, etc.
- Explicit long-term goals (e.g. by 2030) and priorities for reforming the VPET system should be established in the framework of the new governance.
- Capacity-building among stakeholders and an action plan to implement the strategy.
- Defined leadership roles and resources for implementing action plans.
- Establishing a monitoring and accountability system to measure improvement over time.

As shown in some of the case study countries there are already some pilot projects to introduce VET programs in place. However, it is of utmost importance to develop a strategy of up-scaling pilot projects to a system level parallel to an introduction of a pilot program. Therefore, pilot projects should be embedded in a long-term strategy with clear milestones, capacity building, leadership and resources. Such a strategy helps other donors to support and monitor the strategy.

4.2.1 The Labor Market Alignment Strategy

One of the major challenges in all four of the PAC described in this report is that all—or nearly all—decision power is in the hands of education-system actors and not employment-system actors. The approach that must be taken is establishing a **Labor Market Alignment Strategy**. First, we can begin by measuring the current power equilibrium between education- and employment-system actors by applying the KOF Education-Employment Linkage Index (KOF EELI). This begins to profoundly analyze the situation in the four PAC and defines the phases of the educational process (curriculum value chain) in which the business sector could gain decision power (for more information see Renold, et al., 2016; For a concrete application in the US state Colorado see Renold, Caves, Bolli, & Bürgi, 2016).

Figure 5: Example strategy for achieving power equilibrium between actors from the education and employment systems



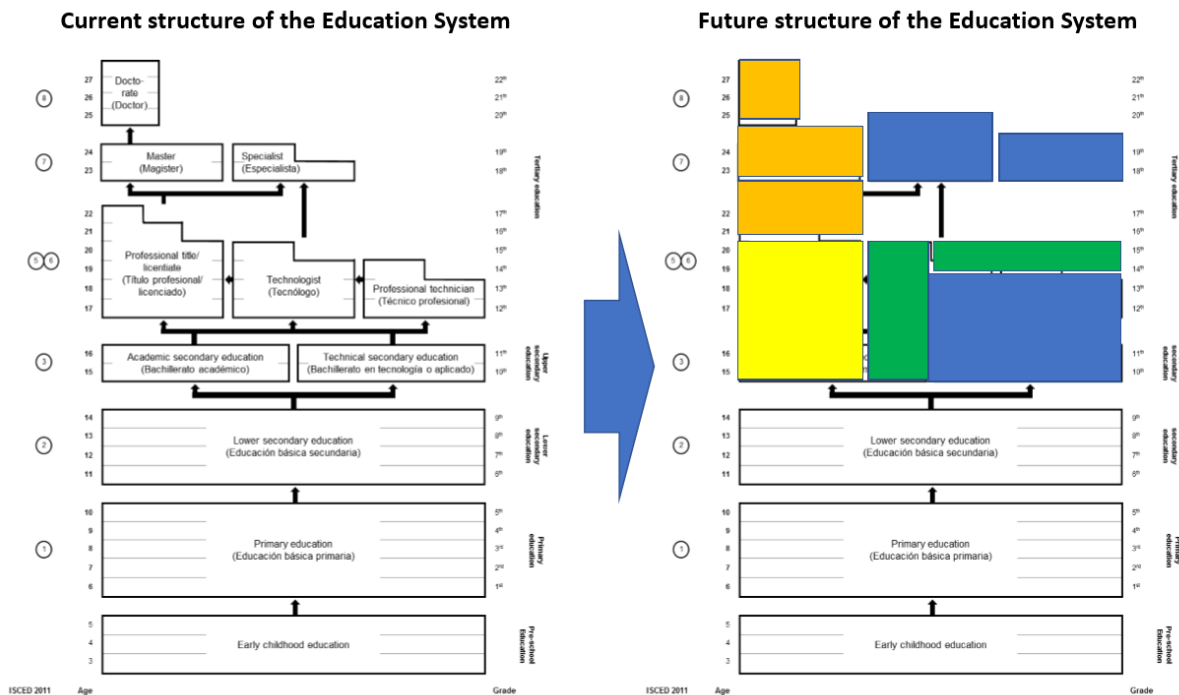
Higher linkage between actors from the education and employment systems goes along with better power sharing. That means that curriculum content and qualification standards are no longer decided by actors from the education side, which improves their labor market relevance and moves them towards industry standards. Along the whole educational process (design, application, feedback phases) both sides fix who has the power to decide about which sub-process.

4.2.2 Restructuring education systems

Another step to improve VPET in the PAC has to do with re-structuring the education systems of each country to improve permeability, equity, and quality. These changes will have to be developed with each country individually according to their own histories, needs, and challenges, but will generally encourage higher education options in VPET, crosswalks and access points among levels and types of education, and clarity in the skills and knowledge of graduates from each program.

Figure 6 summarizes a very preliminary potential example using the example of the Colombian system. Currently, there are no higher or post-secondary options for VET graduates. The blue boxes on the right side of Figure 6 represent an updated VPET system, with the most important change being additional and expanded post-secondary options for VET graduates. Adding PET and higher VET create opportunities for advanced skills development, which helps employers find the skills they need. At the same time, it increases the variety of opportunities available to young people and reduces VET stigma by reducing opportunity costs.

Figure 6: Example of how to re-structure the education system according to a new strategy:



The boxes in green on the right side of Figure 6 illustrate transitional pathways between VET and general education. The vertical area indicates programs that could lead to higher education on either the vocational or general sides, and the horizontal green bar atop the VET section represents an optional period of extra coursework that can qualify VET graduates for university or advanced higher VET coursework. These are critical for permeability across types and levels of education, which enhances equity by enabling late-blooming and disadvantaged students to rejoin the academic track if they so choose. Improving permeability lowers stigma associated with VET and increases the pool of highly skilled individuals by making sure no students with ability but bad timing are left behind.

Finally, the yellow and orange boxes in Figure 6 represent the academic or general secondary and tertiary pathways. These already exist in Colombia, but an enhanced VPET system improves their quality as well. By providing opportunities to young people that are more diverse, the education system allows academic pathways to specialize and improve quality. Universities can move applied and vocationally oriented offerings to the higher VET and PET institutions where they can be better executed, then execute its own research and teaching duties better with improved focus.

Of course, all of these changes require careful consideration to ensure they actually accomplish what they set out to do, but restructuring education systems is a critical step to enabling the other changes that need to happen when improving the VPET systems in PAC countries. This example merely illustrates potential changes and the rationales behind them.

4.2.3 Long-term goals and priorities for reform

The PAC interested in improving VPET can organize reform processes by setting long-term goals and priorities. We can recommend ideas for reasonable and desirable goals and priorities. Some examples are shown below.

Examples for explicit long-term goals and priorities to reform the VPET system (e.g. by 2030):

- 20-30 percent of all upper secondary students (whole cohort) are enrolling in a dual VET program supported by industry organization of a specific sector.
- 5 percent out of dual VET students are following a combined academic and dual VET program which leads to a progression route within the university landscape.
- 30 percent of all upper secondary students (whole cohort) are enrolling in a full-time VET school program with national standards.
- There are no educational programs without transparent further progression routes (no dead end) and clear “exit” and “entrance” conditions.
- Many other goals and priorities are possible based on the individual needs of each PAC.

As mentioned already, one of the most difficult stepping stones will be the substantial engagement of the employer. Therefore, the following section will emphasize what could be organized in order to stimulate a labor market alignment strategy and the other changes recommended in this section.

4.3 Role of multinational companies (e.g. Nestlé) within the reform framework

Labour Market Alignment Strategy

In countries where actors from the education system have all the power in deciding about the educational process, skills mismatch and weak youth labor market outcomes will most probably be the result. Evidence shows that without substantial employer engagement, it will be difficult to overcome the problem (see Renold, et al., 2016).

There is no simple solution to developing such a **Labor Market Alignment Strategy** due to the prisoner’s dilemma which has to be overcome (Caves & Renold, 2016). Without the commitment of a large number of employers, it will not be possible to change the VPET system towards a high performing one. Similarly, the right requests must be made of those employers to make their participation sustainable. Research about cost-benefit-analysis and/or -simulation can help designing an appropriate education process which may help to overcome the prisoner’s dilemma. However, companies need to cooperate to get there.

Creating an Employer Network as a first stepping stone

Therefore, an important first step will be to set up a VET company network. Companies need to help establishing educational processes which fit into the country specific eco-system and lead to a balanced cost-benefit ratio for companies. Big companies like Nestlé could act as incubator of such networks and help to facilitate coordination among companies until an industry organization will be created. Additionally, the big companies could be ambassadors for VET, promoting the program in their networks and they could set an example by providing training places.

The first guidelines to organize such commitments among companies are developed as follows:

First stepping stone for industry: 3 Guiding Principles

FOR PARTICIPATION IN THE INDUSTRY COALITION OF THE PACIFIC ALLIANCE COUNTRIES (PAC)

In order to more effectively integrate youth into the labor market, education must move beyond schools to include the workplace. Commitment of private industries is crucial to effective vocational education and training (VET) programs. Therefore, the members of the PAC-Industry Coalition support the Youth Alliance Initiative by participating in the design, application, and updating of effective VET programs in cooperation with actors from their own countries' education systems.

The three principles below make up the vision for VET programs developed by the PAC-Industry Coalition's Youth Alliance Initiative. These VET programs are dynamic, cooperative endeavors that serve students, industry, and society throughout the PAC. Each principle is accompanied by specific action items that members of industry can take to support the Youth Alliance Initiative in its early development. A signature at the bottom of this document represents a commitment to undertake those action items.

1. Workplace learning is a key component of the new effective VET programs.

Workplace learning has a comparative advantage over classroom learning, gives young professionals training that matches their future occupations, and ensures that the best-available technologies are always used for learning.

Benefits:

- *The results of a Danish study on a VET program for sales assistants shows that both theoretical training in the VET school and practical training in the workplace are necessary to develop competency, and that learning is better if it's done in the right place.*
- *An Australian study finds that university training is too general and too slow in updating when teaching accountants.*

The comparative advantage of workplace learning is especially important for "soft skills." Research indicates that these long-lasting personal, social, and methodological skills are better taught in the workplace than in school.

Workplace learning enables young professionals to learn technical expertise and experience unexpected and real-world working situations. Graduates are prepared to work productively, easing their transitions into the labor market and making them more valuable to their future employers.

Technological change is a fundamental characteristic of all economies. The faster technology progresses, the more difficult it is for schools, colleges, and universities to keep up. Learning in companies ensures that training is provided on state-of-the-art technology and equipment.

Therefore, industry partners agree to:

- **Offer training places in their companies** for young adults aged 15 – 19. Students are educated part-time at school and part-time at work. Workplace training is based on a shared training curriculum framework. Companies are responsible for paying the trainees and ensuring that they pass the final practical exam, while schools are responsible for the general or academic exam.
- **Engage substantially with curriculum development for workplace training.** Employers, young people, and society benefit most when the curriculum matches real work experiences and prepares graduates to work in their trained occupations in any company.

2. *Effective VET programs generate a return on investment for training companies.*

Training benefits students and societies, but it also benefits the bottom line of training companies. Effective VET programs developed through the Youth Alliance Initiative are not philanthropy or corporate social responsibility. They are designed so that companies earn back their investments in training through the productive work and saved recruiting costs they earn by training.

Benefits:

- Companies earn returns on training under the right institutional conditions (see point 3).
- Training has a positive effect on company productivity in the long run because the workforce is of higher quality. Gaining a higher productivity through training is based on a curriculum framework and trained instructors.

Companies in effective international VET systems earn back their training investments through the productive work of trainees and later saved recruiting costs if graduates choose to stay. This model is proven in international contexts and can be developed in the PAC.

Benefits:

- Productivity is an important factor of competitiveness of companies. Syllabus-based training programs lead to a higher productivity of trainees. If companies act as producers of skills, they will benefit compared to other companies.
- If a shortage on the labour market exists, training the own workforce can be an answer to this issue. A higher retention rate of well qualified trainees can save recruitment costs.

Earning a return on the training investment requires long-term training that lasts three to four years starting around age 15, **and high-quality curricula** for both general education and occupational skills that ends in a **well-recognized certification**. This combination means trainees become highly skilled during training, and can accept low training wages because of their youth and the value of the certification.

Benefits:

- High-quality curricula in relevant skills and competences encourage training participants of young adults.
- Working and learning in real workplace environments help young adults to acquire practical experiences. This facilitates transition smoothness from education to employment.
- If companies together with Ministry of education agree to deliver a certificate/diploma which is recognized by legal authorities and the industry organizations, the program become very attractive and can be seen as an alternative to academic education.

Measuring the costs and benefits of training requires extensive data collection and cooperation from industry. However, measurement enables participants to adjust training models to maximize returns. This makes the VET program cheaper for education systems and more profitable for companies.

Benefits:

- Most of the companies are not aware about training costs. If they can understand that VET can be a business case with a ROI they are more interested in working together with actors from the education system.
- Cost-benefit simulation for Spanish VET actors have shown, that it is feasible to create VET programs with a net benefit. If companies are willing to participate in workshops with researchers, they will gain important information for developing their human resources and training programs.
- If companies can attain a net benefit **during the training**, they don't have to care about poaching.

Therefore, industry partners agree to:

- **Participate in cost-benefit studies of training for companies.** These studies include a simulation study before the implementation of new effective VET programs, as well as ongoing monitoring of the system as it develops. Both sets of

analysis directly benefit industry partners by ensuring the programs are developed to provide a return, and enabling them to modify training models and maximize returns once the programs exist.

- Participation includes **answering surveys to provide data, joining discussion groups, and workshops** to develop the best models for training that maximize returns for companies. These efforts identify the country-specific conditions of a strong approach, measure returns to training, and facilitate companies' efforts to streamline their own systems by sharing best practices.

3. *Effective VET programs are based on collaboration, communication, and system-building efforts.*

The new effective VET programs are part of systems that support and engage all parties, including industry, education, government, and students. **Industry is the leader with support from the others.**

Benefit:

- If companies can work together in clusters, associations or clubs, they can share knowledge, work and experiences for the benefit of the whole sector. That facilitates participation of SME in a training approach.

The level of **coordination and communication between industry and education is a critical feature** of effective VET programs. Each side has information the other lacks, and linkage between the two systems enables VET programs to run effectively and efficiently.

Intermediary organizations like Chambers of Commerce and Industry, sector associations, and others are key players in VET programs. They can streamline curriculum development and updating by compiling information from multiple companies, share best practices and materials for training among member companies, and ensure that SMEs and big companies are both represented throughout the processes of VET.

Benefits:

- The power equilibrium in the decision competence of a good VET program is essential for an effective training approach. In the Pacific Alliance countries – compared to top performing countries - there is a lack of decision power of industry institutions and representatives.
- If industry associations or cluster of companies have equal decision power during curriculum development, application and feedback phase, they have a higher probability to get the skills they need.

A **strong systematic approach** facilitates communication not only among partners but also with students, parents, and the media. Companies know they are hiring qualified workers whose experience and training they understand, no matter which company trained them. Students and others know the training is worthwhile because they earn wages while pursuing a valuable credential.

Benefit:

- Institutional support for apprenticeship and trainee program helps companies earn a return by influencing pay, supply of apprentices and curriculum content. If companies can act as producer and consumer of skills, they will gain a comparative advantage.

Therefore, industry partners agree to:

- **Ensure that SMEs are included in all processes**, so that they are willing to participate on a large scale.
- **Cooperate and coordinate with schools, colleges, and their own ministries of education or labor** for the purpose of an efficient and effective VET program in their own countries.
- **Dedicate the necessary human capital and resources participation in workshops, coordination with education actors, and communication with intermediaries.**
- **Make commitment and efforts transparent**, for example by using their company's brand and network to advertise the PAC-Industry Coalition, the Youth Alliance Initiative, and the new VET opportunities for young adults.

Chamber of Commerce and Industry or other industry association could act as partner to convince more companies joining a skills initiative or the Youth Alliance Initiative.

Further stepping stones

Further stepping stones on the way to a well aligned labor market strategy could be the following projects:

- Evaluating the “Willingness to train” among companies from different sectors.
- Creating pilot projects with balanced cost-benefit ratio as incentives for companies to participate based on a simulation study.
- Evaluating success factors and barriers of the implementation of pilot projects.
- Preparing capacity (leaders, reform teams, financial resources) for an up-scaling process.

As indicated in the previous chapter, the first and foremost duty will be the work on a Labor Market Alignment Strategy. The relevant government authorities should work together with the relevant industry association to define a common strategy. A mutual commitment is a pre-condition for re-structuring the VPET system and later on running more pilot projects. Before starting further pilot projects, PAC have to decide about possible re-structure of the whole education system as the attractiveness of the VET and PET depends on several factors within the whole education system. Depending on the long-term goal regarding their enrolment rates within the entire upper secondary education level, the current structure may need some revision. Such a decision should be made in a public-private partnership agreement before starting the next pilot projects.

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