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Scientific Working Group on Vocational Education and Training

Master Vocational Education

Vocational Education and Training in Colombia

Current Situation and Challenges in the Region of Antioquia

Master's Thesis

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Abstract

Over the last decade Colombia's economy saw a dynamic growth but faces a lack of skilled workers to increase the countries productivity. At the same time the biggest part the workforce is informally employed and hardly profits from the economic growth. The system of vocational education fails to fill the gap of skilled workers on the labor market leaving companies in need of personnel and workers without access to quality employment. To understand the reasons for this, qualitative interviews with different stakeholders and observations at VET institutions were conducted. This study describes the current situation of VET in Colombia and the main challenges in this field.

The results show an urgent need for more standardization and control in the education sector. VET faces a massive image problem within Colombia's society, pushing students towards alternative programs. At the same time VET programs have problems regarding quality and a lack of cooperation with the private sector. In conclusion more standardization and cooperation between the stakeholders is needed to improve the quality of the programs and with it the image of VET in Colombia. Further research should include improvement of VET teachers' training and possibilities of dual VET programs in Colombia.

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Whatever the cost of our libraries, the price is cheap compared to that of an ignorant nation.

Walter Cronkite

1 Education – The Key to Social Equity

Was your education important for you? Would your daily life be different if you had not received a basic education in reading and writing? The answer to this question is most certainly yes. Education is one of the most important factors shaping a human's life – and human life in general. Education determines your thinking, your understanding of the world and not last your labor possibilities and therefore your social status within modern society. Education not only shapes our lives on an individual level but societies and countries as a whole. It is an important factor regarding the social and economic development of a nation. Education is a key factor to achieve economic prosperity and social equality in modern societies, enabling the people to participate in the economy and therefore benefit from the economy's prosperity as well as contribute to it.

Serving the community and promoting the general prosperity are named in the Colombian constitution as purposes of the State. In line with these principles the former Colombian president, Juan Manuel Santos, established the goal to make Colombia the most educated nation in Latin America by 2025. The country has quality higher education institutions, well-qualified university graduates and one of the highest economic growth rates in Latin America. (OECD, 2016, p. 24) On top of that, for many Colombians the peace process creates an optimistic climate of change.

However, the economic growth is still mainly based on the export of resources like oil and gold, but not on products produced by Colombia's labor force. (Bundesinstitut für Berufsbildung, 2015, pp. 13-15) Such products would provide more employment opportunities allowing more Colombians to profit from the country's economic development, while the resource-based growth leaves a high proportion of Colombia's labor force in vulnerable often

informal employment situations – not profiting from the country’s high economic growth – often without any option to escape poverty and crime. At the same time, the Colombian labor market faces a lack of skilled workers. The consequences include not only a negative impact on the country’s productivity and economic development, but also high social inequality across society. Closing this gap on the labor market is a chance to increase the economy’s productivity and allow more Colombians to profit from the economic development. Research done by the Organisation for Economic Cooperation and Development (OECD) and the German Federal Institute for Vocational Education and Training (BiBB) already provides information on this problem. The BiBB found in a qualitative study in 2015 that the shortage of skilled workers exists on certain qualification levels, which should be provided by Vocational Education and Training (VET). It comes down to the question, why Colombia’s VET fails to provide adequately qualified graduates in order to fill the void of skilled workers in the labor market.

This study will answer this question, by describing the structure of VET in Colombia and its most pressing challenges. The OECD policy review - Education in Colombia (2016) - describes Colombia’s tertiary education sector. The report provides a first insight, which together with a study of the BiBB (2015) and other sources, will be discussed in the Chapters 2 and 3. In Chapter 2 we will take a more detailed look at the problem stated above and develop sub-research questions. Chapter 3 provides the conceptual background with a description of Colombia’s overall education system, and a definition VET in the context of this study. This description is necessary to provide the context to compare Colombia’s VET programs with German ones and identify relevant differences and similarities in the discussion section. The methods used in data collection through interviews and observations, as well as the approach of the data analyses, are explained in Chapter 4. Chapter 5 concerns the results regarding the structure and challenges of VET programs in Colombia. In the discussion in Chapter 6, I present the structure of Colombia’s VET programs and from that basis, the challenges which lead to an

insufficient number of adequately qualified graduates of these programs. The limitations of this qualitative study are explained in Chapter 7. Chapter 8 finally provides the conclusion to the research question as well as recommendations for possible further steps for the TUM school of education in term of a cooperation with Colombian stakeholders in the field of VET.

2 Research Question and Objectives of the Investigation

There is no perfect education system that fits every country and every country has its own challenges and circumstances. To be successful, an education system must be developed in accordance with the specific requirements of a region. While the basics of primary, secondary and university education are often similar across countries, VET systems differ significantly between countries. And yet, countries can still learn from one another. The German VET system and the process of its development should inform even a country as different as Colombia.

Since vocational education is strongly linked to social, economic and political factors, it makes sense to first examine these premises. The Republic of Colombia is three-times the size of the Federal Republic of Germany. The population includes 49 million people with Spanish as the official language. (Auswärtiges Amt, 2017) Dynamic development and continued growth have characterized Colombia's economic situation for more than a decade. The export of raw materials like oil, coal, coffee, flowers, and food heavily impacts the rate of economic growth; the country's main trading partners are the United States of America and the European Union. Even though the rate of economic growth fell from more than 6,5% in 2011 to 2.3% in 2016 and 1.8% in 2017, due to low prices for raw materials like oil, Colombia continues to be the country with the historically highest rate of economic growth within the big economies of Latin America. (Auswärtiges Amt, 2017)

The last government itself defined in the National Development Plan 2014-2018 the three core pillars of development: peace, equity and education (OECD, 2015, p. 1). The poverty rate dropped from 49.4% in 2002 to 37.2% in 2010 (Brunner, et al., 2012, p. 48). In 2016 the income per capita accounted for 5,623 US-Dollars (Auswärtiges Amt, 2017) and according to recent numbers from the OECD (2016, p. 24) 33% of Colombians live in poverty. Hence, there is still a long way to go for Colombia.

Inequality remains a critical challenge. The relationship between poverty reduction and economic growth is modest at best, which indicates that broad parts of the Colombian society do not benefit from positive economic development. Rural areas especially still suffer from high poverty rates (Brunner, et al., 2012, p. 48). With a proportion of 37:1 between the average incomes of the top 10% to the bottom 10% in 2012, Colombia finds itself with one of the highest income inequalities in the world (OECD average was 9:1 in 2011) (OECD, 2015, p. 3).

Inequality and poverty are naturally linked with the employment situation. While the official rate of unemployment is relatively low at 8.3%, underemployment is estimated at around 25% (Auswärtiges Amt, 2017). However, according to OECD (2016, p. 25) “70% of the workforce is employed in the informal economy”, which undermines the efforts to reduce poverty and inequality.

Continuous dynamic growth in the Colombian economy also demands a growing workforce. The workforce is not keeping up: there is a lack of skilled professionals in many sectors including the oil and gas industry, mining, hotels and mechanical engineering (Bundesinstitut für Berufsbildung, 2015, p. 13). Thus, while there is a high rate of underemployment and an immense informal sector there is also a lack of qualified workers. The problem seems to be that the underemployed workforce does not have the required qualifications to participate in the growing economy. The culprit would appear to be an education system which is supposed to provide these qualifications but for some reason does not. The objective of this investigation is to shed light on the relationship between this problem and the situation of the VET system, with a focus on the region of Antioquia. Therefore, this study has to answer the following questions: what is the current structure of VET in Colombia? What are the main challenges of VET in Colombia? Do these challenges explain the lack of skilled workers in Colombia’s labor market? And how can the TUM School of Education, in cooperation with the University of Antioquia, act to improve the situation?

To answer these questions, I will first describe Colombia's system for vocational education and its structure. This includes a short description of Colombia's education system as a whole, since the field of vocational education can only be understood in the context of the whole system. The objective is to describe the structure of the system as it is planned, as well as the actual situation: how is the VET system structured and integrated into the wider educational system? What are the active institutions in this system? What are the different roles played by each institution and what is their relationship to each other?

Based on this description, I will analyze the most pressing challenges that VET in Colombia is facing and how those are related to the shortage of qualified workers in the Colombian labor market: what are the main challenges and what are the reasons for them? Are there already strategies in place to solve these problems? And finally, what are possibilities, for the TUM School of Education, especially with its expertise in the German dual system, to act in cooperation with local stakeholders to support the process of solving these problems?

This thesis is supposed to be a first step to assess the possibilities of further cooperation between the TUM School of Education and local stakeholders in the region of Antioquia. Successful cooperation requires mutual understanding. Therefore, it is important not only to identify the structure and challenges of the VET system in Colombia but to also describe the relevant differences between the Colombian and German VET systems.

3 Conceptual Framework

At present, there is no commonly shared understanding of Vocational Education and Training (VET) in Colombia. It is therefore important to define what is meant by VET in the context of this investigation. In its study, the BiBB (2015) stated that it is not possible to clearly distinguish vocational education from academic education in Colombia. It is therefore important to define which educational programs in Colombia fall under the classification of VET in this thesis. To do this we first need to take a look at Colombia's general education system.

3.1 Colombia's Education System

The Colombian education system is divided into four overall levels: *Educación inicial* (preschooler education), *educación básica* (basic education), *educación media* (middle education) and *educación superior* (higher education) (OECD, 2016, p. 28). VET does not exist as one uniformly defined separate path within the Colombian education system, as it is the case in Germany. Elements of what in Germany is part of the VET system can be found in different parts of the Colombian education system, which will become clearer in the following overview.

The Colombian Ministry of National Education (MEN) is the highest institution in Colombia's education sector, but each region in the country holds significant power in how education is administered and implemented; regional institutions play an important role in the conception and the implementation of educational strategies and policies in each region (Bundesinstitut für Berufsbildung, 2015, p. 21). While the MEN establishes the rules through national law, the so-called Certified Territorial Entities "are responsible for defining and implementing education policy, monitoring quality and the educational provision of all public and private schools [...]" (OECD, 2016, p. 42). Every department has the status of a Certified Territorial Entity and local authorities like districts or municipalities are given this status if they fulfill certain criteria like financial and physical capacities (OECD, 2016, p. 42). Medellín has

this status and therefore Medellín’s secretariat of education has the responsibilities described above.

The following overview describes the general situation in Colombia and is the basis for a more specific examination of the situation in the region of Antioquia. If not labeled differently, the two sources for the following description are a report of the OECD (2016, pp. 26-29) on education in Colombia and a study published by the BiBB (2015, pp. 23-26). To avoid misunderstandings, the Spanish terms will be used throughout the text for concepts which do not have an English translation with the identical meaning. As we will see in the results section the reality in Antioquia does not always fit the information provided by these sources.

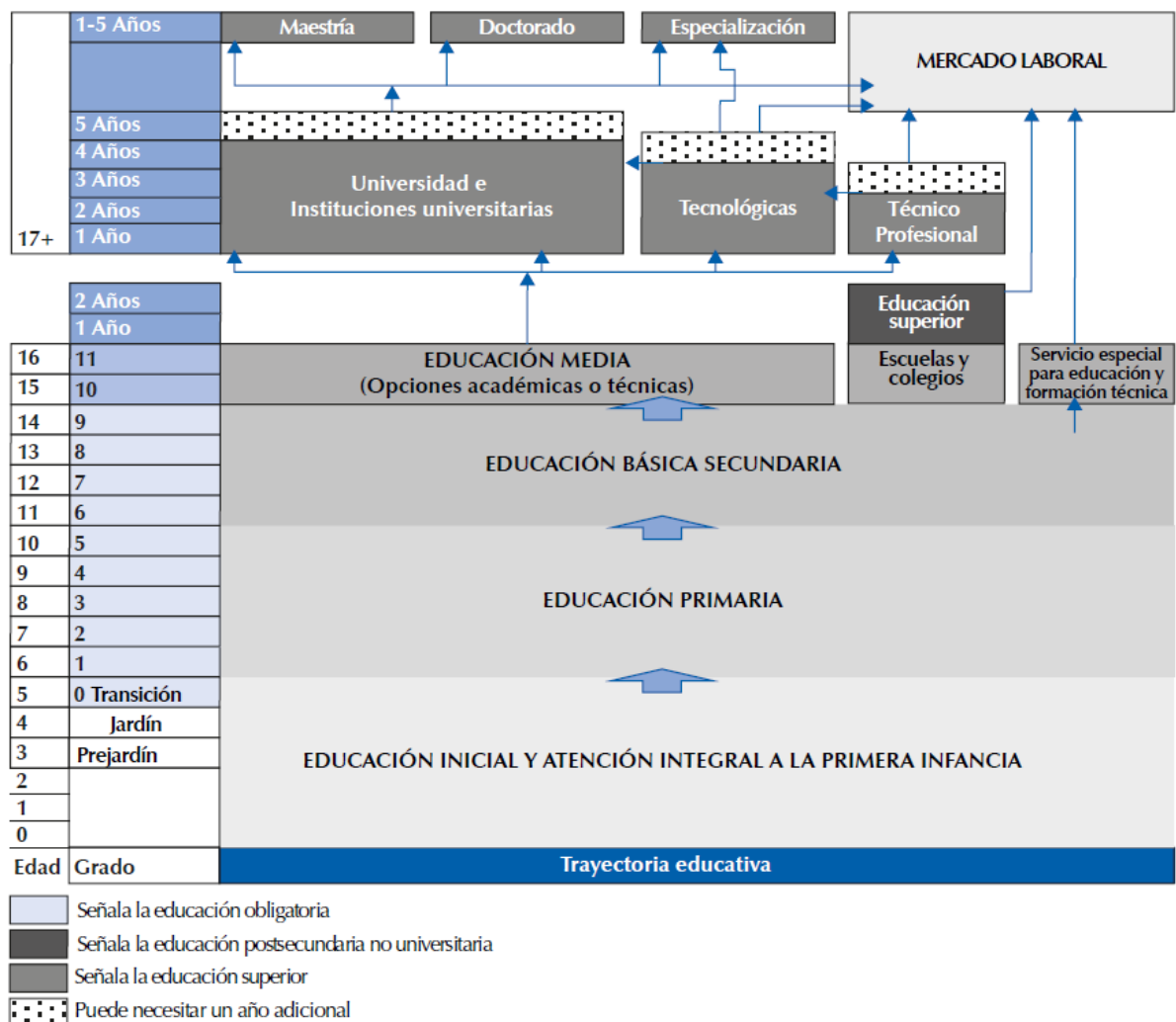


Figure 1: the Colombian education system (OECD, 2016, p. 27).

3.1.1 Educación inicial and educación básica.

The preschool level, *educación inicial*, starts from the age of three and is divided in three years: *Prejardín*, *jardín*, and *transición*. The *educación básica* is divided into two parts, which are called *educación básica primaria* (first to fifth grade) and *educación básica secundaria* (grade seven to ten). Normally the *educación básica secundaria* is completed at the age of 14.

3.1.2 Educación media.

Until this level, the Colombian education follows a uniform way. Within the *educación secundaria*, also termed *educación media*, there exist two possible paths: *educación media académica* and *educación media técnica*. Regardless, this level takes two years and, upon completion, the students graduate with the *bachiller* – the official entrance qualification for programs in the field higher education, even though entrance qualifications may differ between institutions and are not organized uniformly for the sector of higher education. The *educación media académica*, concentrates on humanities and art or science, whereas students in the *educación media técnica*, can choose from different fields. During the *educación técnica* the students undergo a practical-oriented phase which is offered by a VET institution in cooperation with the school. Depending on the school, students who graduate successfully from the *educación media técnica* receive their *bachiller* as well as a degree *técnico laboral* in their field.

3.1.3 Educación superior.

Access to universities and other institutions of higher education is not regulated uniformly. Many educational institutions at this level have individual rules. There are four different groups of institutions in this sector: universities, university institutions, technical institutions and technological institutions. Not all institutions can offer all types of programs. While universities are allowed to offer programs up to the postgraduate level, university institutions can offer undergraduate programs as well as the special form of the *especialización*,

which is a postgraduate program but on a lower level than the university master's level. Technical institutions provide the *formación profesional técnica*, which takes one and a half years. The programs offered by technological institutions are called *formación profesional tecnología* and take two years. Both offer an additional specialization in certain subjects and can be combined with each other. The difference between both programs lies in the competencies that are taught. While technical programs concentrate on specific skills, the technological programs focus on more complex competencies like analytical reasoning.

3.1.4 Educación por el trabajo y el desarrollo humano.

The *educación para el trabajo y el desarrollo humano* (ETDH) is also called *educación informal* and is not part of Colombia's formal education system. Programs in this field are offered by Colombian National Service for Vocational Education (SENA) and other institutions. There two types of programs in the ETDH: programs of *formación laboral* and programs of *formación académica*. The former focuses on concrete vocational skills. There are different programs in this field: *auxiliares / operarios* as well as *técnicos laborales*. To access these programs students must have completed the *educación básica primaria* (fifth grade). The duration of the program is 900 hours for the *auxiliares / operarios* and 1760 hours for the *técnicos laborales*. If the students graduate successfully from these courses from an officially recognized institution they receive a certificate.

The second type of programs offered in the ETDH sector includes the programs of *formación académica* which focus on math, science, and technology, humanities as well as languages and have a minimum of 160 hours. These programs provide a way for students who left school without a degree to achieve the *bachiller*. There are also specialized courses in other academic fields to prepare for university admission tests. (Ministerio de Educación Nacional, 2016)

3.2 Definition of VET

The Colombia Data Report on Vocational Education and Training 2016, which was published by SENA (2016, p. 11), defines vocational training as...

...the formative educational process, both organized and systematic, through which people acquire and develop specific or transversal work-related competencies throughout their lives, related to one or several occupational fields referred to in the National Classification of Occupations, which allow the individual to exercise a productive activity as an employee or entrepreneur either individually or collectively.

This definition is taken from the Decree 2020 of 2006 of the Colombian Vice Ministry of Higher Education. More specifically, the report defines programs in different sectors of the Colombian education system as VET, starting with the programs of *tecnico laboral* which are offered as part of the *educación media*. In the sector of *educación para el trabajo y el desarrollo humano*, are the programs on the level of *auxiliar/operator* and *técnico laboral* and bellow. In the higher education sector of the Colombian education system there are the *técnico profesional*, *tecnólogo*, and *especialización tecnológico* programs. Following this definition, VET in the context of this study refers to these programs.

4 Methodical Approach

The collection of data was carried out via two different methods: interviews with relevant experts, and field observations at VET institutions. While the interviews provided data mainly at the macro level, i.e. the institutional and organizational circumstances of VET, the observations focus on the micro level, providing information about the concrete learning and teaching situations in the educational institutions.

The relevant experts for the interviews were identified with the help of the Datus research group. I chose the different experts with the goal to include the perspectives of different stakeholder groups in the Colombian tertiary education system. This includes experts which worked for government institutions like Medellín's secretariat of education or the Colombian national education ministry (MEN) and SENA; experts from higher education institutions which offer VET programs; and experts from private organizations to bring in the perspective of companies and the private sector. The contact was established by Dr. Gomez, head of the Datus research group, and in some cases by experts, who were already interviewed.

4.1 Interviews

The objective of the interviews was to gain information about the macro level of Colombia's VET-system. All the interviewed experts had sophisticated knowledge and experience in the field of VET in Colombia due to their professional role, and high-level positions in relevant institutions. At the same time, each person offered a different perspective since they worked in different organizations and institutions which, again, have different interests and objectives within the Colombian education system.

4.1.1 Interviewed experts.

Interview 1 was done with an expert who was currently working as a director in the field of education for PROANTIOQUIA, a private foundation founded by a group of companies in the region of Antioquia. Their main objectives include catalyzing a social transformation for

increased equality and sustainable economic development. The foundation considers education a key factor in achieving these paradigms. Prior to this position, the expert worked at SENA and the MEN in high-level positions; both positions were in the recent past and both of these institutions continue to play an important role in the Colombian education system. Interview 2 was conducted with an expert who recently worked in high-level positions for SENA as well as in the MEN. In both institutions the interviewee held a high-level position with broad insights into political and operational issues. When the interview was held, the person was not employed at a Colombian entity. Even though the Experts 1 and 2 worked together at SENA and the MEN, their fields of work differed. Interviews 3 and 4 were done with the presidents of two major higher education institutions in Medellín. Due to their roles, both offered sophisticated knowledge about the structure and situation of the education system as well as current challenges in the field. The institutions include the Institución Universitaria Pascual Bravo and the Instituto Tecnológico Metropolitano (ITM). Interview 5 was done with an expert of the Consejo Privado de Competitividad (CPC), who was working in the field of education. The CPC is a non-profit organization founded in 2006 by a conglomerate of companies and universities. The main goal of this institution is to contribute directly to the articulation of strategies for the improvement of Colombia's competitiveness. Along with other topics, education is one of the key factors for the CPC and the institution conducts research in this field. Interview 6 was done with a regional director of SENA. The Servicio Nacional de Aprendizaje is the biggest institution in the field of VET in Antioquia and Colombia. On top of that, SENA has a unique role within the education system when compared to other educational institutions due to its legal framework.

Interview 7 was conducted with three experts from ITM which are responsible for the training program for the teachers of this higher education institution. All three have an extensive academic background in pedagogy and didactics – in two cases at Ph.D. level. Interviewee 8

was working in a high-level position at Medellín's secretariat of education. The expertise of this expert lays in the cooperation between the government organization, the educational institutions, and the private sector as well as the projects and reforms conducted by the government of Medellín in the education sector.

4.1.2 Development of the interview questions.

The interview methodology was developed following the methods described by Hussy, Schreier, and Echterhoff (2017). All eight interviews were conducted in a half-standardized design as guided interviews. The questions were developed on the basis of literature previously mentioned in Chapters 2 and 3 and grouped into sections "The structure of vocational training in Antioquia" and "Challenges and problems in the field of vocational training in Antioquia". Before the interview the experts received a document via e-mail which informed them about the goal of the investigation and the methods used. The experts were also asked about their understanding of VET. At the beginning of each interview, the definition of VET in the context of this investigation was clarified. This was important since for many Colombians only ETDH programs are seen as VET, but not higher education programs. Thus, the absence of a common understanding of VET prior to the interview could have influenced the answers of the interviewees.

The information collected in the first interviews allowed me to specify some questions and add new ones so that the questions continued to develop during the investigation. Some experts spoke on topics before the responding question was asked; thus, the order of the topics varied in different interviews.

4.1.3 Conduction of the interviews.

Six interviews were conducted in person and two were conducted via video conferencing because one interviewee was not in Latin America at the time and the other was in another part of Colombia. In both cases, an interview in person was not possible during my

stay in Colombia. The original plan had been to conduct both interviews via the telecommunication application Skype. However, this was not possible for one interviewee; his interview was conducted via the telecommunication application WhatsApp under the request of the interviewee. In both cases only the audio of the interview was recorded and not the video itself. Since problems with internet connection are quite common in Colombia, I tested both programs as well as the recording of the audio several times beforehand. The interviews finally took place without technical problems.

The interview questions were formulated in English and sent via email to the interviewees at least one day before the interview (the text which was sent to the interviewees, including the questions, can be found in the annex of this document). Not all interviewees spoke English well enough to conduct the interview in English and some preferred to answer the questions in Spanish. The interviews with Experts 1, 2 and 5 were conducted completely in English. Experts 3, 4 and 6 were interviewed with the help of the translators from their own institutions. Interviews 7 and 8 were conducted completely in Spanish.

All the interviews were audio-recorded and transcribed in Microsoft Word. I translated the interviews conducted in Spanish myself into English after transcribing them first in Spanish. The members of the Datus research group supported me in the translation of several Spanish phrases which were not immediately clear to me.

4.2 Observation

The second method was the observation of education processes and education facilities. While data collected through interviews provides insight at the macro level, direct observation provides insight at the micro level (what is actually happening in the learning environment). I visited one public high school, three training centers of SENA as well as two different higher education institutions. Every visit started with a tour through the education facility guided either by the head of the institution or by a teacher. I observed lessons and was able to speak with

students and teachers. I protocolled all observations and information gathered in the conversations with students and teachers in observation protocols on my computer and took photos.

4.3 Analysis

The data transcripts from the eight interviews and four observations total 74 pages of text. Sixty pages from the interviews and 14 from the observations. Both were analyzed in the same way using the program for qualitative data analysis, Atlas.ti. The program allowed to categorize the content of the text in different codes. Because in this investigation it is not only important what was said, but also which expert said it, the original phrases were not further reduced; they were always analyzed in context. An example of a code is the image problem of VET programs. All passages in the text, referring to the image of VET, were marked in Atlas.ti with code “challenge_Image_VET” as for example the passage: “They associate those types of degrees with education for poor people, and no one wants to be like [the] poor”. In this way I organized all relevant information from the interviews and observations into different codes. An example of a coded text can be found in the annex of this document. In each code the information was clustered again to see if the experts agreed on a topic or if there were different opinions to be emphasized in the results section. If relevant for the context, the source of each information is clarified in the text or through the letter I (Interview) and O (Observation). Finally, I structured the codes in the main fields: overview and structure, and challenges. Both fields have different subtopics.

5 Results

All the information presented in this section was collected through the interviews and observations which were conducted especially for this investigation. The section is structured into two main subsections: overview and structure, and challenges. Both have several subtopics. Of course, it is not possible to completely separate the structure of a system from the challenges it faces, and the overview already contains results which are also relevant for the challenges. The goal of this structure is to provide the reader with a systematic path through the collected data. Therefore, some information might be mentioned various times in different parts of this topic. The results presented in the first section give the reader a general overview of Colombia’s VET programs. This provides a foundation to enable the reader to fit the results concerning the challenges, presented in the second section, in the picture.

5.1 Overview and Structure of Tertiary Education in Colombia

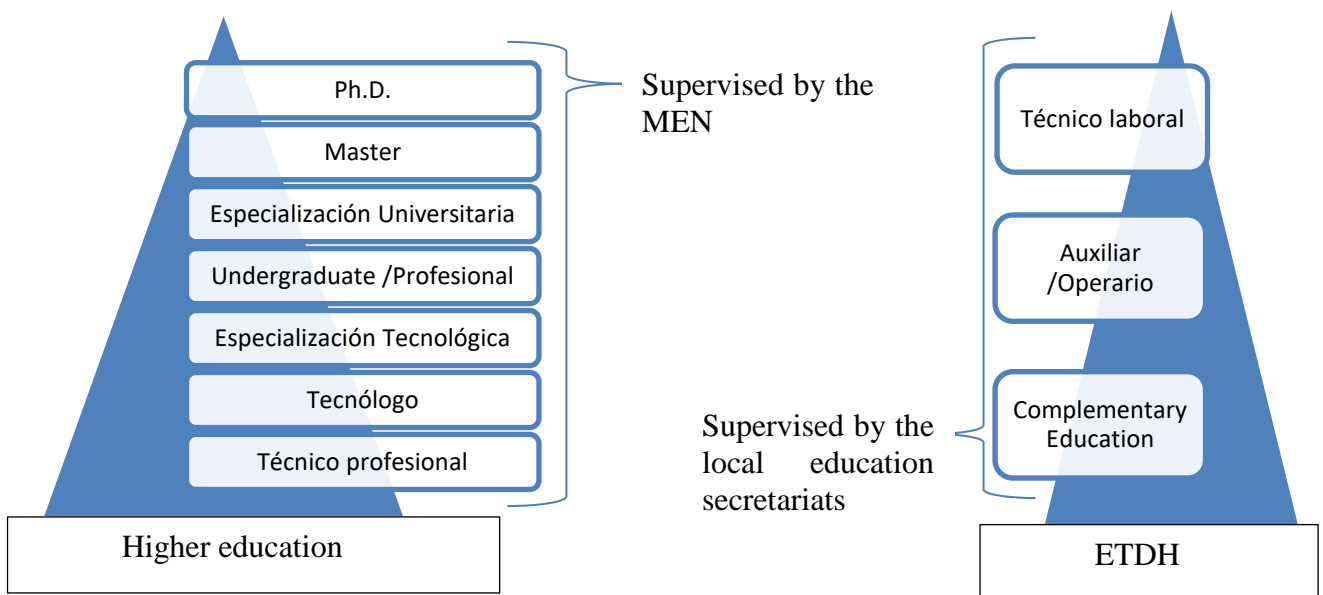


Figure 2: overview and structure of tertiary education in Colombia.

Programs of tertiary education in Colombia can be divided into two sectors: programs in the systems of higher education and programs in the field of ETDH. (I 6) Following the definition of VET made in Chapter 3.2, VET includes programs which can be found in both

sectors. ETDH consists among others of *técnico laboral*, *auxiliar* and complementary courses. Higher education encompasses every program from the level of *técnico profesional* including university careers, up to the Ph.D. According to the CPC, 70% of the people studying after high school study at universities while only 30% study in VET programs. While the sector of higher education is supervised by the MEN, the ETDH sector is supervised by the local educational secretariats, such as the Secretariat of Education of Medellín. (I 1) SENA is the biggest provider of education in Colombia and offers programs in ETDH as well as in the field of higher education. (I 5) While *técnico profesional* and *tecnólogo* and all higher degrees are part of higher education, *técnico laboral* and subsidiary degrees belong to the ETDH sector. (I 6)

5.1.1 SENA.

According to the expert from the CPC, SENA offers 50% of the *técnico* and *tecnólogo* programs. The governmental organization is the biggest provider of education in both sectors, ETDH and higher education. (I 5) All the interviewees agree that SENA has a unique role in the Colombian education system. Even though we will find many aspects which are related to this in more detail in many of the following sections, some important results about SENA should be explained beforehand.

SENA as an institution belongs to the Ministry of Labour. For this reason, SENA is not dependent on MEN unlike the remaining institutions in the field of higher education. SENA is not financed by MEN, but by the Ministry of Labour, in part through special taxes paid by companies. In contrast, the other higher education institutions are financially dependent on MEN. (I 1) According to interviewee 1 this leads to the fact that SENA has a much bigger budget than the other institutions, which again leads to the fact that it is much easier for SENA to hire people and acquire equipment like machines for educational purposes. (I 4) Another unique aspect is that all programs at SENA are free from charge for students. At other higher

education institutions, students must pay at least a small amount as well as in the ETDH sector.

(I 1)

As explained in more detail in the following section on higher education, in order to offer a program at the level of *técnico profesional* or above, institutions must obtain a certification from MEN. According to Interviewee 4 – the president of another educational institution – in the past, SENA did not have to fulfill the same conditions as the other institutions to obtain this certification. However, the expert stated that now SENA must also comply with these rules. (I 4) In the field of ETDH, SENA not only offers programs but is also responsible for the curricular framework in this field. These curricula are also binding for the programs offered at other institutions in the ETDH sector. SENA, therefore, has the double function of providing education programs as well as setting the rules for every other institution that provides these programs in ETDH. (I 5) In addition, it was mentioned many times by the experts that SENA, as an organization, operates in isolation from the rest of the stakeholders and suffers from a lack of communication.

5.1.2 ETDH.

In the interviews nearly all experts used the term *educación informal* as a synonym for the ETDH sector while the sector of higher education was called *educación formal*. Several institutions provide ETDH education, but SENA is by far the biggest. According to Interviewee 2, there are more than 3000 institutions in Colombia which offer VET in this field and thereby compete with SENA. To access a ETDH program students do not have to hold a *bachiller* degree but can gain access without finishing basic education. (I 1) As mentioned before, from the government side, this sector is supposed to be supervised by the local education secretariats. Several experts, including one from the education secretariat of Medellín, claimed that there is no effective control over these programs.

5.1.2.1 *The National Classification of Occupations.*

As mentioned earlier, SENA not only provides training programs but also controls the curricula in the ETDH sector regulated through the National Classification of Occupations (NCO) – the framework for the curriculum in each occupational sector. The NCO is developed by SENA in cooperation with the private sector and defines the needed competencies for each occupation. (I 6) SENA hosts 85 sectorial boards where each board is responsible for a specific occupational sector. The boards include representatives from the private sector, other educational institutions, and relevant ministries. They develop specifications for the contents of each training program. SENA develops competency expectations based on this outcome. At the end of this standardized process, there is a document specifying the expected competencies as well as key contents for each occupation. (O 3) This process is meant as a continuous way of updating the training programs according to developments in the private sector. (I 1) Interviewee 2, who worked for MEN during the ministry's effort to build up a national qualification framework, stated that this skill-based approach of the NCO could be used as part of such a framework. According to the interviews the sectorial boards play a crucial role in the cooperation between the industry and the educational institutions. Nevertheless, Interviewee 1 stressed that the sectorial boards do not work because of the lack of the meaningful participation from the side of the industry. The reason for this is according to the same expert that “the industry is kind of tired of SENA”.

5.1.2.2 *Programs in ETDH.*

Different programs exist in the ETDH sector with the *técnico laboral* as the highest possible degree. At SENA students can finish a *técnico laboral* in 15 months where the first nine months of academic training are followed by six months of apprenticeship in a company. (O 2) The programs of *operario* and *auxiliar* can be shorter, between six months and one year. These programs are very basic and low-level according to interviewee 1. The curriculum at

SENA is based on the NCO that must be followed by other providers of these programs as well. Companies are legally obligated to either hire a student for his apprenticeship or to pay a certain amount of money for not doing so. This regulation is called *contrato de aprendizaje* and is overseen by SENA. It only applies to companies with more than a certain number of employees; according to Interviewee 1, this number is 15. Interviewee 6 stated that if other educational institutions want to send their students into an apprenticeship they have to cooperate with SENA. Nevertheless, to successfully graduate as *técnico laboral* students do not have to spend time working in a company - the apprenticeship is not mandatory at SENA and other institutions. Students have, for example, the option to complete an investigation or draft a business plan instead of working in a company. (I 6) SENA conducts controls at the companies that take in students. According to the expert, these controls are supposed to make sure that the occupation of the students in the companies meets the educational goals. However, the expert claimed that these controls are seldom conducted effectively. (I 6)

5.1.2.3 *Media técnica.*

The *educación media* consists of grades ten and eleven in Colombian schools where they can be combined with a *técnico laboral* program. This possibility is foreseen by Colombian national law and is called *media técnica*. The government of Medellín makes use of this possibility and offers the *media técnica* in 178 of 229 of its public schools. (I 8) The students in these programs receive not only the *bachiller* degree after completing the final grade but also the title of *técnico laboral* in a specific area. The curriculum of the program is designed in cooperation with a VET institution. In Medellín, this VET institution is SENA in around 40% of these programs. (I 8) Over the course of two years, the VET institution holds additional classes for the students and integrates these lessons into the normal curriculum of 10th and 11th grade. (O 1)

According to the expert from the Secretariat of Education the goal of the *media técnica* is not only to enable the graduates to start working after they finish school but also to increase continuity towards higher education. The expert claimed that students from this program have a higher interest in continuing to university and it is easier for them to do so. (I 8)

5.1.3 Higher education.

While students can normally access the programs in the ETDH sector without academic requirements, they must hold a *bachiller* to enter programs in the higher education sector. This sector not only includes all universities, but also education intuitions which offer VET programs on the level of *técnico laboral* or above. Presidents of two such higher education institutions were interviewed. Both institutions were not universities but offered courses up to the level of postgraduates; one will even start to offer a Ph.D. program. (I 3) Both institutions offer *tecnólogo* programs, *profesional* programs, and *especialización* programs. (I 3; I 4)

The interviewed experts expressed a very clear conception of the difference between higher education and ETDH. In summary, it comes down to the idea that ETDH trains people to fulfill a very specific task while higher education programs enable students to reflect on their own activity and provide solutions to problems. As an example, interviewee 4 claimed that “the students who go into a technical education are basically trained to do things. Do what you are told to do but you are not considered to improve processes or think of different ways how to do things.” (I 4)

5.1.3.1 VET programs in higher education.

Starting with *técnico profesional*, higher education contains all the programs up to the Ph.D. Of the VET programs defined in Chapter 3.2, the *técnico profesional*, *tecnólogo*, and *especialización tecnológica* are the higher education programs that can be seen as VET. These programs are supervised by the MEN which is responsible for all programs in higher education. This includes the control of the programs offered by SENA in this sector even though SENA is

otherwise not linked to the MEN and was previously not subject to these controls. (I 4) The controls are conducted in a standardized process: to offer a program, the institution must apply for a permit. To receive the permit the institution must fulfill 15 quality standards. Those include, for example, the infrastructure of the institution, like gymnasium and health services for the students or a library, as well as the financial situation. (I 4) According to interviewee 4, these standards are controlled quite well but do not provide a standardization of the programs which are offered by different institutions. In fact, the interviews and the observations revealed big differences between programs offered by different institutions regarding their duration and content. For example, the *tecnólogos* offered by SENA last around two years while a program with the same title at the Institución Universitaria Pascual Bravo or ITM takes at least three years.

5.1.3.2 Continuation possibilities.

Many higher education institutions offer programs above the *tecnólogo*. One such degree is the *profesional* which is at the same level as an undergraduate degree at a university and generally takes five years. However, students of the Institución Universitaria Pascual Bravo and the ITM who have already mastered a *tecnólogo* program can continue to a *profesional* program in the same field and graduate in just one and half years because the curricula build upon one another. This way, it is possible for the students to graduate with the title *tecnólogo* and the title *profesional* within five years. According to the experts, that is not the case for students of SENA. The institution does not offer *profesional* programs and according to the interviews, *tecnólogo* graduates from SENA cannot continue directly to the *profesional* programs offered at the other institution. This is due to the large differences in curricula and especially because students at SENA learn less basic science than students in the other institutions. Thus, the *tecnólogo* graduates from SENA must start from the beginning if they attempt a program at another institution. (I 4)

5.1.4 Differences in curriculums and educational philosophy.

The earlier chapters already painted a picture of SENA's unique role in the Colombian education system. According to the interviews, this role involves a different educational approach and philosophy. This is most apparent when comparing SENA to other institutions offering VET in the field of higher education. The experts from these institutions clearly stated that there exists a substantial difference between programs offered by SENA and those offered by them and that the reason for this lays in the fact that SENA is part of the Ministry of Labour. According to an expert from another higher education institution, the main difference in the curriculum is that SENA's *tecnólogos* have much less basic science education. (I 3)

[...] our formation is harder and more intensive than SENA's programs. SENA says we don't need math and physics because we need people that go to the industry right now and quickly. We say no, we have to take the time to prepare the people correctly to go to the industry. (I 4)

The interviews gave a clear picture of the different philosophies that are the basis for the different curricula. According to the experts SENA seeks to train students as fast as possible to start working, whereas other institutions educate their students on a more sophisticated scientific basis. According to an expert of such an institution, this broader education enables their students "to provide solutions once they are on the job" because they are able to reflect the whole working process rather than only working on one specific task. (I 3)

From the perspective of the expert of SENA, their own programs are in fact focused on the doing process rather than covering all the knowledge of a subject and its history. (I 6)

According to these different philosophies, there is a big difference in the design of the curricula. The curricula of students of classical higher education institutions have classes in basic science subjects like physics, math or chemistry which are often not directly connected to practical content. The schedules are organized in the different subjects like *matemática 1* and *matemática 2*. Their goal is to create a wholesome education process that includes natural science and social science, languages, sports as well as practical laboratories. (I 4)

The programs of SENA follow a very different approach. Within SENA there is no difference in the structure of programs offered in the ETDH sector and programs offered in the sector of higher education. The schedules of these programs are not divided into different subjects like *matemática 1* and *matemática 2* as is the case at the other institutions. Instead, the students work with a *guía de aprendizaje*. This document is like a guide to the learning process; the students need to fulfill tasks, from researching theory to concrete practical deeds. Through the process of fulfilling these tasks the students achieve competencies and learn the relevant content. In this way, the students at SENA spend most of the time working continuously on projects. On top of the continuous education in the technical field, which is the biggest component, the students at SENA also have classes in English, environmental education, sports, security at work, ethics and, in the *tecnólogo* programs, business administration. (O 3) Due to this, the students at SENA have much less theoretical lessons than the students of other institutions. Thus, SENA and the Institución Universitaria Pascual Bravo offer both a *técnico automotriz* and both lead to the same title even though the actual education differs in methods, contents, and educational aims. (I 4)

5.1.5 Qualification of teachers.

Another aspect that played a central role in the results of the interviews was the education of teachers. According to Interviewee 1, there is no degree to become a teacher in the field of VET. VET teachers would rather get a special training once they start working. (I 1) The requirements to become a teacher depend on the institution as well as on the position of the teacher. An extra interview on this topic was conducted with experts who are responsible for the formation of the teachers in the higher education institution ITM. According to them, the requirements depend on the official regulation for higher education institutions. The following results describe the situation at all higher education institutions which offer VET. However, as we will see later, SENA has different regulations. (I 7)

Type of teacher	Full-time teachers		Part-time teachers
	Profesores de carrera	Profesores ocasionales	
Minimum degree	Master's degree	Master's degree	Especialización
Minimum experience	Two years	Two years	One year
Other requirements:	<ul style="list-style-type: none"> ▪ Add. requirements of the institution ▪ General knowledge test ▪ Certain English skills ▪ Research proposal 	<ul style="list-style-type: none"> ▪ Add. requirements of the institution 	<ul style="list-style-type: none"> ▪ Add. requirements of the institution

Table 1: Types of teachers at public higher education institutions without SENA

The interview revealed that there are different regulations depending on the status of a teacher. Different legal statuses for teachers are *profesor ocasional* and *profesor de carrera*. On top of that, it matters if the teachers work full-time or part-time. Part-time teachers are only contracted for certain hours of teaching each week; they normally also work professionally at companies or as teachers at other educational institutions. The requirements for part-time teachers differ from those for full-time teachers: according to the interview, they must have a postgraduate degree with the minimum title of *especialización universitaria*. Furthermore, they need to have one year of experience. This experience can either be working experience as a teacher or professional working experience in a company, both of which must be in the field in which they are teaching in. (I 7)

Within the full-time teachers, the different legal statuses are relevant: *profesores de carrera* and *profesores ocasionales*. The main difference is that the first group must fulfill the official requirements for higher education teachers, set by the government. This group has a permanent employment contract while the *profesores ocasionales* are only employed for a certain period of time. *Profesores de carrera* also have the possibility to climb up the different stages of career in the public education sector.

To enter this sector as *profesores de carrera* in a publicly funded higher education institution like for example ITM the teachers have to fulfill certain requirements. The basic requirements are a master's degree and a certain level of English skills as well as two years of experience: either professional working experience in a relevant field or two years of teaching experience. On top of that the person has to present a research proposal. In difference to that, *profesores ocasionales* only need at least a master's degree and two years of experience but do not have to fulfill the other requirement of the *profesores de carrera*. (I 7)

Interviewee 2 claims that due to a decision of Colombia's supreme court SENA is not a higher education institution, but the *tecnólogo* programs which are offered by SENA are officially part of the higher education sector. (I 2) Because of this, according to Interviewee 7, SENA does not have to fulfill the same regulations as ITM and other higher education institutions. Indeed, the interview with SENA showed that SENA has different regulations and their teachers are on very different levels. Some hold a Ph.D. while other teachers have no higher education degree at all but graduated from a ETDH program. To teach, teachers have to hold at least a title on the level of the program they are teaching. The teacher of a *técnico* program must hold at least a *técnico* title himself. On top of that, the requirements to become a teacher at SENA according to Interviewee 6 are six month of teaching experience as well as 18 months of professional working experience in the relevant field. (I 6)

Some teachers were asked about the minimum requirements for teachers in the course of the observations in SENA centers. According to them, it is also possible to enter as a teacher without experience in the field of teaching. But in this case the person has to absolve additional online courses to gain the competencies to be a teacher. (O 3)

5.1.6 School infrastructure and organization.

The observations gave not only an opportunity to collect information about the organisation of the schools and educational institutions but also to take pictures from the actual infrastructure. All images were made by the author.

5.1.6.1 *Media técnica.*

Image 1 and 2 show the classroom of a public high school in Medellín which offers the program *media técnica*. The students of the 11th grade which were observed here had a total of 41 lessons per week, of which 11 were held by instructors from SENA. The institution cooperates with the school to offer the *media técnica*. The other 30 lessons are spent on the normal compulsory subjects of the 11th grade. Most classroom in the school have a flat screen to show presentations. Projectors were only installed in bigger rooms for special purposes, like assemblies. The students do not have private books for the subjects taught in school. Instead,



Image 1: classroom with blackboard, whiteboard and flat screen of an 11th grade *media técnica*.

they can access all the relevant documents on an online platform or at the library of the school, which we see in Image 5.



Image 2: chairs of the students and walls with posters in the classroom.

The lessons organized by SENA for the *media técnica* do normally not take place in the classrooms but at practical facilities depending on the sector of the *técnico laboral*. The students in this class studied in a program in the field environmental conservation. Their practical lessons consisted mainly of planning and realizing projects such as vertical gardens or permaculture gardens.



Image 3: students of the media técnica with their permaculture project.



Image 5: another group of students with their vertical garden project.

As described in Chapter 5.1.2.3 the students of the *media técnica* receive not only the *bachiller* after successful graduation but also the *técnico laboral*. The students in the 11th grade I visited seemed to be very proud of their projects and all of them stated that they want to continue studying after they finish the 11th grade. Most of them planned to continue to the *tecnólogo* offered by SENA in the field of environmental conservation.



Image 4: library of a high school in Medellín.

According to the teachers, this high school is one of the best examples for the positive development of public schools in Medellín. The area of the school mainly consists of steep hills and a big proportion of its inhabitants came to Medellín as refugees from other parts of

Colombia, starting unauthorized settlements. The teachers also stated that not all public schools in Medellín are at the same level as this one and that students in private school receive much more resources as it is the case in the public schools.

5.1.6.2 SENA's education facilities.

I visited three different SENA education centers: the center for advanced technologies and manufacturing, the center for design and production of clothing, and the center for health services. The classes at SENA take place in three shifts: from 6 am to 12 am; from 12 am to 6 pm; and from 6 pm to 10 pm. Each group of students has only one shift daily. Therefore, the students can attend class in the morning and work in the afternoon or the other way round.



Image 6: students receiving a theoretical lesson in the working environment of the laboratory.

As the results in Chapter 5.1.4 show, the curriculums of SENA are focused on practical competencies which is also reflected in the infrastructure of the classrooms and laboratories. The students of the *técnico* and *tecnólogo* programs in automotive field work for example with engines, that are especially prepared for educative purposes. However, the students at workshops of SENA also repair private cars as part of the lessons. As in other institutions the

students receive all relevant documents through an online platform. Theory lessons are sometimes conducted via digital courses which each student has to execute on a computer.



Image 8: dismantled gearbox and modified engine for education purposes.



Image 7: students at SENA using digital information systems.



Image 10: students working in SENA's automotive workshop on a private car.



Image 9: manufacturing robotic arm and modern computerized numerical control (CNC) milling machine.

Due to its budget SENA has more technical equipment in its education centers than other Colombian education providers. For example, in the field of manufacturing technology

SENA is well equipped. The center has several modern milling machines and other equipment for automatized manufacturing.



Image 12: fully functioning model of automatized production line.



Image 11: students from a tecnólogo program for design assistants in a theoretical lesson.

The observation in the SENA center for the design and production of clothing painted a similar picture. In this center all occupations that are related to the clothing industry are taught.



Image 14: students from a técnico program in production of clothing working under instructions of their teachers.



Image 13: students from a técnico program in the field of repair and maintenance of sewing machines.

5.1.6.3 Institución Universitaria Pascual Bravo.

As the results in Chapter 5.1.4 show, the students in VET programs of higher education institutions have much more basic science education in their programs, which takes place in classrooms, similarly equipped as the classroom in image 1 and 2. The classrooms in these institutions as well as classrooms in SENA are normally equipped with a whiteboard and a flat screen. Only a small number of classrooms is equipped with a projector.



Image 15: students working in groups under the instruction of teachers in the automotive laboratory of Pascual Bravo.

The automotive laboratory of this institution is much smaller than the workshop in SENA's automotive section and has less equipment. However, the students in the automotive programs at the Institución Universitaria Pascual Bravo spend much less time in the workshops than the students at SENA.



Image 16: a teacher at the Institución Universitaria Pascual Bravo explaining the functions of a carburetor and students disassembling and assembling different models of carburetors.

5.2 Challenges

Structures and challenges are interconnected. In the previous chapter some challenges were already mentioned in the results regarding the structure. Building upon the context provided by the last chapter we will now concentrate on the issues that were clearly named by the interviewees as challenges, problems or things that must change. The results on these issues refer to different levels from the level of national politics to the concrete education process in the classrooms of VET programs. It is also important to highlight that the interviews showed that the experts have different views on some of these challenges. Therefore, it is not only important what was said in the interviews but also by whom it was said.

5.2.1 Labor market and private sector.

Our labor market is made up of probably 70% of people who get a university degree and probably 30% who get vocational degree. For years we have been trying to shift that at least to get 50/50 and to organize this in a better way. (I 1)

This quote of Interviewee 1 formulates one of the fundamental challenges of the Colombian labor market that was also mentioned by Interviewee 5. This expert, who works for the CPC, stated that the proportion of 70% university and 30% vocational programs leads to a gap in the labor market because the companies do not find people with the right qualifications to fill in their open positions. (I 5) The experts state two main reasons for this gap. Reason one: the share of the workforce with a vocational education is too small and reason two: the graduates of VET programs do often not fit the requirements of the labor market. So, while there are many highly educated people as well as people who are on a very low occupational level the Colombian economy is in need for more people with qualifications in between. (I 2)

According to Interviewee 5, the private sector sees *técnico* and *tecnólogo* programs as a key to fill this gap and improve the productivity of Colombia's economy. (I 5) Nevertheless, the private sector and the educational institutions are not effectively communicating with each other. This lack of communication, which was mentioned by Interviewee 1, makes it harder to design education programs according to the needs of the labor market and to fill the qualification gap. Adding to that companies do not know which program leads to which competences and therefore prefer to hire people who do not cost them much money and often retrain the employees on the job. (I 1) This seems to be in line with the statement of Interviewee 4, who is the president of a higher education institution himself. According to him, the industry prefers graduates from shorter ETDH programs rather than graduates from *tecnólogo* and *técnico profesional* programs because they think "they have to pay more salaries for the people who made a longer program." (I 4) Similarly, Interviewee 5 said that the private sector is paying people with vocational education not "according to their productivity but they pay them a lot less than people with a university degree." This creates a climate where students tend to prefer a university program over a VET program because all the incentives are on the university education. (I 5)

5.2.2 Image and reputation of VET.

The results in the last paragraph give some explanations for the lack of qualified VET graduates in the labor market and why the majority of people prefers a university education over a VET program. The problem behind this, so many experts argued, has to do with the image and the reputation of VET in Colombia. Asked about the image of VET, Interviewee 1 stated that students “associate those types of degrees with education for poor people, and no one wants to be like poor.” (I 1) Interviewee 2 gave a similar statement:

[...] the main goal of most people is to receive a university education. Only a view people think the studies of SENA are very good. The general idea of the people is that if you receive a technical education in SENA you have a bad future and the value is very low.

On top of that, the same expert added that the “majority of the students in [ETDH] programs are from poor or vulnerable backgrounds, because everybody who can afford it goes to a university.” (I 2) Interviewee 5 stated that vocational education and training is seen as second-class education while in Colombia everybody has the goal to become a lawyer, an engineer or a doctor. To change this conception is, according to this expert, a big challenge, since it is rooted strongly in the Colombian society. (I 5)

In those statements the experts agreed that the bad image of VET is the main reason for the relatively low proportion of students which choose to study a VET program. Interviewee 1 raised another important point: while the students prefer universities over VET institutions these institutions themselves also find it more attractive to offer university education than vocational programs. Universities receive more money and autonomy from the government so that “all of the institutions that offer programs of higher education, are at some point pushing towards becoming a university”. (I 1) Interviewee 3, the president of a higher education stated: “We are actually working as a university but due to the Colombian legislation we are not an actual university.”

5.2.3 Standardization and control.

The results shown in the last paragraph paint a clear picture about the problematic image of the VET sector in Colombia. Another challenge which was described by different experts is that for the stakeholders in the education system it is not clear which title indicates which kind of curriculum or which kind of competencies. The results on this topic can be grouped in two main challenges: firstly, that there are not enough regulations in this field, and secondly that the regulation which do exist are not enforced effectively. Both problems lead to fundamental differences between programs. So, while the students receive the same title, for example the *tecnólogo* degree, their qualifications might be very different. (I 2) Interviewee 1 named this as one reason for the already described bad image of VET programs: because there are no quality standards for VET-programs they are seen as “education for poor people”.

5.2.3.1 *Insufficient regulations.*

We have already seen that the interviews revealed fundamental differences in conception of VET-programs offered by different institutions. The experts agreed that there is a lack of effective regulation, which could provide standardization of programs across all institutions. Different institutions reward the same titles even though their programs differ fundamentally in educational processes and regarding time and content. This lack of effective standardization through regulations has two main reasons according to the experts: one, as mentioned, is the fact that SENA depends mainly on the Ministry of Labour and not on the MEN like the other institutions which offer higher education programs. Because of that SENA is not supervised in the same way as the other institutions. (I 4)

The second reason for the lack of standardization is the autonomy of the educational institutions in general. According to interviewee 5, this autonomy enables, for example, the higher education institutions to decide independently what they want to teach, and the MEN has no authority to change the curriculums. Expert 4 who himself represents a higher education

institution stated that there is a control of certain quality standards by the MEN. Nevertheless, the same expert also claimed that “this is controlled quite good but does not actually provide a standardization.” According to him the institutions know which skills should be taught in which program out of tradition, but there is no regulation. Instead of a legally standardized way to develop a curriculum every institution creates its own curriculum according to its traditions and processes.

A similar problem was mentioned for the field of ETDH. According to Interviewee 8, who was at the time of the interview working with the Secretariat of Education in Medellín, the problem here as well is a lack of legal regulations. While the law enables the secretariats to supervise the opening of new education programs in the ETDH sector, there are no clear rules on how this supervision should be conducted. According to an example the same expert gave, the secretariats of education in the end have to accept the programs as they are proposed by the educational institution without being able to change the curriculum. This expert stated as well that neither on national nor at local level there is a legal framework which would enable the institutions to take action in the field of education quality assurance. The regulations and controls are not focused on the quality of the education process but on administrative categories like the routes of evacuation in the buildings or the number of teachers in the institution. (I 8) Interviewee 8 concludes that changing the legal framework is necessary to address these challenges.

Another example for a lack of standardization is the certification of the successful graduation from school and VET programs: The title *bachiller* is given to the students after completing grade 11. In difference to many other countries, the students do not have to sit for a final exam to receive to the *bachiller* and every school can decide individually on the exact criteria for receiving the certificate of successful graduation. During the visit of a higher education institution the teachers stated that there is no final test to receive the title *tecnólogo*.

Hence, the title is granted on the basis of the individual evaluation system of each institution.

(O 2)

5.2.3.2 *SABER.*

Every student has to participate in the standardized test SABER 11 after grade 11. Even though this test is identical for all schools in Colombia it does not provide a standardization. It is only designed to measure the quality of the schools but has no influence on the *bachiller* or the final grades of the graduates. (O 1) Because of these circumstances, the skills of the students depend very much on the school they attended and the *bachiller* does not provide an objective standardized benchmark for the competences of a student. Similarly, students who graduate from a program of higher education have to take the SABER Pro test. But like SABER 11 this test has no influence on the grades of the students but is only used to evaluate the educational institution. (O 2)

5.2.3.3 *Insufficient control.*

On top of these problems which arise from a lack of regulations, the experts mentioned other problems due to ineffective control of existing regulations. According to Interviewee 5 of the CPC, the biggest problems with missing control and standardization exist in the ETDH sector. Regulations for the ETDH programs are provided by the NCO but according to the expert the education secretariats, which are responsible for this sector, do not control these regulations properly. Interviewee 1 claimed as well that the secretariats prioritize the controls in the field of *educación básica*, over the programs of the ETDH and do not control them properly. Interviewee 2 stated: “the educational secretaries don’t have the capacities to check these programs for their quality, because there are so many.” On top of that, the students often pay for the ETDH programs directly to the institutions which again leads to less control than in higher education sector where the institutions receive at least part of their money through Colombia’s education ministry. (I 2) Adding to the insufficient control of the standards defined

in the NCO, SENA does not have a clear differentiation between the level of *técnico* and *tecnólogo*. It is not clear which skills and competencies make the difference between a graduate of a *técnico* program and a graduate of a *tecnólogo* program besides the different duration. (I 2)

5.2.3.4 Consequences.

This lack of common standards in the field of higher education and ETDH has different consequences. On one hand, the employers do not know which competencies a person with a certain title has. On the other hand, the students do not know either which competencies they get in which program. This is especially problematic when they want to decide which educational path they want to choose. (I 1) It is unclear what different certificates actually mean and this creates further problems for the students. (I 5) Many institutions do not recognize the certificates of other institutions. For example, the Institución Universitaria Pascual Bravo does not recognize the *técnico laboral* awarded by SENA. For SENA's students this means they have to start from the beginning even though they already have a title. This does not only account for the *media técnica* but also for other programs of SENA, like *tecnólogo* programs, which are not accepted by other educational institutions due to the differences in the curriculum, which were already mentioned earlier. (I 4)

5.2.4 National Tertiary Education System (SNET).

“We have a mosaic of things, in which the people don't talk to each other. “This quote of Interviewee 1 is a good description of what was expressed by nearly all experts when asked about the challenges in the Colombian education system. With this statement, Interviewee 1 claimed that there is no system but rather several institutions which do not communicate with each other. Interviewee 8 as well stated: “we are not a system. We say that we have an educational system, but there are several systems within the system that are not connected.” To solve this problem, which is strongly linked to the already mentioned lack of standardization

and control, the last government tried to introduce a National Tertiary Education System (SNET) but failed. The new system was not introduced, and the interviews showed different opinions on the process and the idea behind the reform.

5.2.4.1 The approach to introduce a national system of tertiary education.

The OECD recommended the introduction of such a tertiary education system to the Colombian government with the goal to organize higher education and ETDH in one system. (I 1) SNET has three main components: a national qualification framework; a system for certification and recognition; and a system for quality assurance. (I 5) The government wanted to create one system in which the programs of the technical education like *técnicos* and *tecnólogos*, and university education would be parallel to each other. The types of education would still be seen with their differences but at the same time there would be links and connections between both. (I 2)

The goal was to make it easier for the students to change between the two systems during their educational path. National qualification frameworks are the core of this system and the basis to relate different programs with each other on the basis of normed competencies. (I 1) Interviewee 1 stated that “the qualification frameworks would not only allow students to navigate the system, but also it is important for employers to know which kind of qualification is provided by which program.” Interviewee 2 commented on this topic that the national qualification frameworks “are not an exercise that you do once and then it is finished. It actually requires that you take these catalogs from time to time and revise and update them.” This process was described by the expert as a continuous communication between the educational institutions and the industry. Those would have to cooperate to continuously update the framework according to the needs of the economy. Each framework has eight levels, each with certain defined competencies. The level eight, the highest one, is the degree of Ph. D. which only exists in the university education. The competence expectations developed by SENA

would fit the levels one to four. In SNET the government planned to have VET-degrees also for the levels 5, 6 and 7. Each program must fit the competencies of its level in the qualification framework. (I 2)

Even though the SNET was not introduced, some national qualification frameworks were successfully developed for certain areas. These frameworks are meant to set the standards to reform the curriculums of the different institutions in a standardized manner. (I 1) And indeed, the Colombian education ministry successfully started a pilot project in cooperation with some higher education institutions. The institutions developed new curriculums which is supposed to provide stronger links to the private sector similar to the NCO. (I 2) Interviewee 4, who's institution took part in the pilot project argued that at this moment the project has the character of an experiment since the existing qualification frameworks are not mandatory – even though some frameworks that define competencies for each level already exist, and some institutions developed their curriculums according to that, the other educational institutions are not required to do so.

5.2.4.2 Unsuccessful implementation.

All interviewed experts without exception agreed that a reform of the education system is needed. Nevertheless, there are very different perspectives on the government's approach to implement the SNET and why it failed. Interviewee 1 was working for the government side on SNET. According to this expert the reform failed due to the opposition from the side of the universities because “They think vocational educational training is not education, they see it more as something low [...] [and] could not imagine that a university with a long tradition would be on the same level as SENA and other vocational institutions.” Interviewee 5 claims that the universities are against the reform because they are afraid they could lose the autonomy over the design of their programs due to the standardization. Interviewee 6 from SENA states that in “the field of higher education the universities dominate [political] decisions. If they are

not happy with a decision of the government, they can create enough political pressure to stop the process.” The same expert adds that the universities are in favor of a reform, but not in the way the government proposed it. Interviewee 4 claims that the government did not consult with other stakeholders in this process. Even though the higher education institutions he is working for is in favor of a reform of the education law the approach of the government according to him was unrealistic because “Denmark needed about forty years to change their educational system and our last minister wanted to make it in two years. That is crazy.” Regarding the content of the reform, the same expert doubts that putting major universities and small educational institutions in the same system would be successful since they are not on the same level.

Interviewee 8 participated in different consulting events of the SNET process and stated that “the process was not done very good.” This expert stressed that the process failed because of the higher education institutions and gave different reasons for this. According to the expert, many academics are not in favor of promoting VET. In the new system some VET degrees would be on the same level as classical university degrees, and the universities fear this would undermine the credibility of their degrees. On top of that, the same experts stated that the higher education organizations are against the reform because of their own economic interests and the fact that they would have to change their curriculums. According to Interviewee 6 the reform failed for now but might be realized in the future after the 2018 elections. Interviewee 2 stressed that the discussion is halted right now but the first step for a reform has been taken. The expert from the local education secretariat in Medellin resolved that “Medellin is creating its own tertiary system. Only that it is much slower for [...] a local authority.”

5.2.5 Dual VET programs.

All the interviewed experts stated to be familiar with the German dual VET. The experts also agreed that they would like to have a similar system in Colombia but identified this as a

big challenge. Expert 3, the president of a higher education institution, stated that they “would like to copy the German system and [...] already worked with experts from Germany”. Expert 4, president of another higher education institution in Antioquia, claimed as well that they would like to introduce a dual VET system and the expert from the CPC, who visited a German factory with dual system, said this system would “guarantee that people learn what they have to learn in order to be productive and support enterprises and companies”.

The main difference between the dual VET programs and the curriculums of the programs like *técnico* and *tecnólogo* is the alternation between working place and school. Students of SENA already have the option to work in a company during their apprenticeship. The difference to a dual VET system as it exists in Germany is that there is no alternation, but the students first complete theoretical education before they start working in a company. (I 1) The other higher education institutions have the same structure in their *tecnólogo* programs and like at SENA the students can choose an alternative, like writing a thesis, or a technical report about the time working in a company. (I 3)

Nevertheless, the interviews revealed that some Colombian companies already offer dual VET programs. (I 5) For example, Interviewee 1 was working with SENA on the approach to introduce some dual programs using the German system as a blueprint. Expert 5, director at SENA, stated that there are various dual programs in cooperation with the private sector but only on the scale of model projects due to different obstacles for the implementation. Various of these obstacles were named in the interviews. The first one is the political process: according to Expert 3, to broadly introduce a dual VET system fundamental changes are needed in the system. But even though the government is in favor of introducing the dual system, there is no clear path for the needed reform, and because of that many educational institutions do not want to take the risk of starting a program in this format. Another point is that in order to introduce a dual VET system you need the partners in the industry. While companies with more than 15

employees are legally obligated to take in a student from SENA for an apprenticeship this is not the case for students of other institutions. (I 4) To introduce a dual VET system more working spaces in the industry are needed and according to Interviewee 4 there are “a lot of people that study in *técnico* and *tecnólogo* programs but the industry doesn't have the capacity to train them.”

Other experts also mentioned the training of the students in the companies as the biggest challenge for the introduction of a dual VET system. According to Interviewee 5, from the CPC, companies have to invest time and other resources to integrate a dual VET system in their production. Many companies are not willing to put in the human and financial resources, which are needed for the training itself as well as for the cooperation with the educational institutions. “They would really like to have highly trained people, but they don't want to train them.” (I 5) Interviewee 6, who also visited German VET institutions, put it this way: “I think in Germany, there was first the culture of apprenticeships and afterwards it was institutionalized. Here we have to do it the other way around, introducing new regulations in order to change the culture and this is a lot harder.”

5.2.6 Political conditions and corruption.

The interviews revealed several aspects that refer to the political conditions. Obviously, the so far unsuccessful process to introduce SNET is at least partly connected to the political conditions. According to the interviews, political processes lack continuity within the MEN, which is one important aspect. But on top of that it is the development of SENA due to political goals and its vulnerability to corruption in some parts of the institution that were described as problematic in the interviews.

5.2.6.1 Lack of continuity.

At least here in Colombia things change quite fast. It is not only the change of the president, like every four years and everything changes. But what happens here is that even within the same presidential period you can have three different ministers of education, and each of them

will have a different idea. So, it is quite sad because there is no continuity.

In this quote Interviewee 1 explained the lack continuity in Colombia. Interviewee 2 gave another more concrete example in the context of the already mentioned failed implementation of a national system of tertiary education. According to this example the main problem is the fast change of government strategy: “one day the government says, yes we like this idea. But the other day they don’t like it and half the people have to give up their job.” (I 2) The expert complained that due to this there was no stable team working on the topic of educational reform which makes it difficult to make progress in the actual projects. Interviewee 2 also claimed that many Colombian institutions have internal organization problems. The former high-level employee from SENA stated that there is no “system to receive information in a systematic way, but you would need this information for your decisions.” The expert mentions for example that he never received information about the meetings between SENA and the private sector even though the expert was SENA’s academic director at that time.

5.2.6.2 The special role of SENA.

As described above SENA structurally belongs to the Ministry of Labour. Interviewee 6, who at the time of the interview worked for the institution himself stated that there are many challenges due to direct political interference in SENA. Interviewee 2 gave a similar statement:

There is also a lot of corruption and the intervention of political issues in SENA. When I was with SENA the director of SENA was a politician not an education expert. The director after her was Prada. He first continued my work. But now the person in charge has no clue about SENA and in the last three years we had a lot of problems. There is no change and no process.

As concrete example for this political interference Interviewee 6 mentioned the coverage of higher education programs. According to the expert, in 2016 1.4 million people studied in regular programs at SENA while it were only 145,000 in 2001. This means that in just 15 years the number of students grew by the factor ten. This does not include the people in

complementary courses, who's number increased as well. The reason is a political decision of the government to increase the coverage. (I 6) Interviewee 4 connected the growth of SENA with the government's plan to become a member of the OECD. To join OECD Colombia needs to fulfill certain criteria. One criteria is to increase the number of students in the higher education programs. According to the expert, the other higher education institutions are not able to meet the coverage goals. Therefore, the government tries to meet this goal through SENA. (I 4) Interviewee 4 gave a clear statement about this situation:

[SENA] just want[s] to spit out people as fast as they can to fulfill the demand of the industry. So, they say let's cut everything out of the programs that is not needed by de industry. They cut away math, algebra trigonometry and the sciences. That way they eliminated easily a year or even two years of the program. So that is the big difference they just do this to fulfill what the president of Colombia is asking them to do.

According to the same expert, this is one reason for the big differences in duration and curriculums between SENA's *tecnólogo* programs and the ones offered by other higher education institutions. The expert added that SENA plays "an important role to provide education to people that might not be able to afford higher education otherwise" but complained that SENA does not have to comply with same rules because they belong to another ministry. The interviews also revealed that the growth of SENA had an effect on the situation of the SENA's own employment structure. According to Interviewee 6, 35,000 people were working for SENA at the time of the interview. Out of those 35,000 only around 5,000 had a long-term contract and the other 30,000 were employed based on one-year contracts. The number of people with short-term contracts increased from around 2,000 people in 2002 to around 30,000 in 2017. This increase was necessary to cope with the growing coverage. (I 6)

According to several experts which were working for SENA this high number of short-term contracts makes the institution vulnerable for corruption. Interviewee 1 claimed that giving out short-term contracts is used as a tool to make politics. Interviewee 6 explained more closely

that those contracts are given out to people in exchange for other services, as for example to a community leader who makes sure that a certain number of people votes for a certain political candidate. Therefore, “the jobs in SENA are not necessarily given to the person that is best qualified for it.” (I 6) Several experts explained that SENA is especially vulnerable to financial corruption as well because the institution has a huge financial budget.

5.2.7 High student dropout rate.

Interviewee 8 stresses that the problem for the students in higher education in Medellin “is not so much the problem of access [...]. The problem today is permanence. That the student manages to remain within the educational system.” In fact, interviews and observations painted a clear picture that all the visited higher education institutions have a common problem: a high dropout rate of the students. Meaning that many students who start a higher education program stop attending the program before they successfully graduate. This paragraph shows the results of the interviews and the observations on the problem itself, the reasons the experts mentioned for it, as well as their strategies to prevent student drop out.

Student drop out was mentioned in all visited higher education institutions. In a *tecnólogo* class of SENA in the textile sector from originally 25 students only 16 were still continuing the class after several months. (O 2) I found a similar situation in a *tecnólogo* program of SENA in the automotive sector. There, according to the students, of the 15 students who started the class only eight were left after six months. According to the director of this SENA center, the average dropout rate is about 15% - 18%. (O 3) But SENA is not the only institution with this problem. The Institución Universitaria Pascual Bravo as well, has around 20% of the students drop out before graduation (O 4) and Interviewee 7 from ITM revealed that preventing students from dropping out without a degree is one of the main challenges in their institution.

5.2.7.1 *Reasons for the high dropout rate.*

As for the reasons, why the students leave the programs early most of the experts mentioned that this is related to the social-economic background of the students. According to an expert of the Institución Universitaria Pascual Bravo, the majority of their students comes from families with a low social-economic status. (O 4) A teacher of SENA stated the same for the students of SENA and adds that especially students from such a background are more likely to break up their education because of financial issues, pregnancy or other private problems. (O 2)

Interviewee 3 and 6, which are both experts of higher education institutions, offered an additional explanation. According to them many students, lack the skills and qualification they would need for the programs in higher education. Interviewee 6 from SENA stated “that the basic education is not very good. The kids have problems with reading, math, and languages.” Similarly, Interviewee 4 claimed Colombia has “to do a lot of work in improving the quality of education on the basic levels and the high school level. Because when the students come to our institutions they have huge gaps, even in Spanish. The main reason for this is the education of the teachers.” While these experts stated that the main reason for the drop out lies in the quality of the basic education, Interviewee 8, who is working in the field of basic education, argued something else. According to this expert, the main reason lies in the lack of an organized education system:

We say that we have an educational system, but there are several systems within the system that are not connected: Básica primaria, básica secundaria, educación media, superior, técnico and primer infancia. It turns out that the educación media says that the kids do not arrive prepared to their program, and that this is the fault of básica secundaria. Those of básica secundaria say that they do not arrive prepared and that this is the fault of básica primaria. And these say it's the fault of primer infancia.

Interviewee 8 concluded that the problem is the communication between the higher education institutions and the high schools, leading to the fact that many arrive at the higher

education institution with a lack of skills. According to this expert, the solution for this problem is not to lower the standards at the higher education institutions but to improve the communication between them and the basic education sector.

5.2.7.2 Countermeasures against the high dropout rate.

While most experts agreed that a more systematic organization of the Colombian education sector is necessary to improve the situation some very concrete strategies to prevent student dropout are already in place. As mentioned earlier Interviewee 8 stressed the positive example of the *educación media técnica*. According to the expert, students of the *media técnica* in Medellín have better skills and are better prepared for higher education than students with normal *educación media*. The higher education institutions themselves have strategies as well to improve the permanence of the students. Interviewee 7 named the goal of reducing student dropout as a focus of ITM's training for teachers. The goal is to provide the teachers with the pedagogical skills they need to efficiently support the students when they are in danger of falling behind. The visit to the campus of the Institución Universitaria Pascual Bravo revealed that teachers give additional daily tutorials in the library. These tutorials are free and supposed to give students with deficits the support they need to keep up with the normal lessons. (O 4)

5.2.8 Quality of teachers.

As we saw in the last chapter, some experts stated that the low quality of teachers is responsible for the student's knowledge gaps after they finish school. In fact, the quality of teachers was mentioned as a central challenge by all the experts. Not only regarding teachers in the basic education but as well teachers in the VET programs, which are the focus of this thesis. While we already described the results regarding the training of teachers and the related legal structure in Chapter 5.1.5, this section will focus on the challenges in this field.

The general problem is that the level of quality of these teachers is very low. They often lack basic skills, have problems with reading, problems with math. But this is a structural problem in Colombia, because our

system of education is so bad. We are kind in a vicious circle, but we need to break out of it with more training for the teachers.

In this statement Interviewee 2 stressed not only the central role of the teachers' qualification for the whole education system but also said that it is a structural problem. Interviewee 4 claimed that this "also has to do with the low salaries that the teachers earn. There is no incentive that a very good professional should become a teacher. He would rather look for another profession." (I 4) Nevertheless, Interviewee 6 from SENA argued that "since our teachers are well paid compared to the labor market it is not difficult to find people." (I 6) But interviewee 2, another expert who was also working for SENA in high level position, stressed that "right now, the level [of the teachers in SENA] is very bad, even though there are exceptions. SENA is so big you can find all kind of teachers there." Interviewee 1 addressed several gaps in the education of teachers and stated that there is a need for a qualification framework for teaching. According to the expert, the teachers do not only need pedagogical theory but also more competencies on "how to address the classroom". The same expert stated that there are teachers which hold higher education degrees but still lack basic competencies. Interviewee 8 claimed that the main problem regarding the teachers for VET programs is the needed combination of competences. It is difficult to find a teacher which has the competences and knowledge of the vocational field as well as pedagogical competences. The main challenge of ITM is according to their own statement the teachers' skills in didactics and pedagogy while the competences in the taught subjects are sufficient. Therefore, the ITM has started a program to further educate their teachers. The so-called *Escuela de Formación Docente* offers a course which the teachers can absolve during their normal working time. The courses are held by experts in the field of pedagogy and didactics. The two experts who worked in this field had both a broad experience in the field of education and the work with teachers. One with Ph.D. in the teaching of mathematics. The course is structured in four modules and is conducted one evening per week parallel to the normal school schedule. Contents of the course are basic

principles and the pedagogical philosophy of the ITM, educational planning processes didactics and implementation in the classroom specifically for each discipline, how to support students and evaluation. (I7) The Institución Universitaria Pascual Bravo also offers an internal program for those teachers who do not have a degree in education. This training runs over the course of one year and teaches pedagogical skills as well as how to teach in a higher education institution. (I4) According to the Interviewees 1 and 2, SENA has a program to train teachers as well. As mentioned earlier, new teachers at SENA have to do online courses. On top of that SENA is building up the so-called *Escuela de Instructores*. The aim of this institution is to standardize the qualifications of teachers through training them. (I1) According to Interviewee 1 it is quite normal that SENA sends teachers to partners in other countries to be trained as teachers. On the other hand Interviewee 2 stated that within SENA you can find a wide range of teachers with different levels of qualifications and that in general the quality of the teachers is very low and they often lack basic skills. So the experts agreed that SENA is using a lot of recourses to increase the quality of their teachers but at the same time most of them state that the quality is very low.

6 Discussion

To start a structured discussion, we must come back to the beginning of the thesis and look at the research question in light of the results. The main challenge is a shortage of vocationally-skilled workers in the Colombian labor market. The results of this investigation suggest that while there are enough higher qualified university graduates, there is a lack of workers with comprehensive vocational competencies and abilities. People with these skills should be qualified in Colombia's VET programs. However, the results suggest that Colombia's VET system does not meet this goal, leaving companies in need for skilled workers, and socio-economically disadvantaged people without access to quality employment and therefore without the possibility to benefit from the country's economic development.

The question that arises is why there are not enough qualified VET graduates to fit the lack of workers with comprehensive vocational competencies and abilities. We therefore follow the research question: what is the current structure of VET in Colombia? What are the main challenges of VET in Colombia? According to the results, we can identify two main challenges:

- Firstly, the number of students studying in vocational programs is too small compared with the number of students choosing a university program. While university programs are chosen by 70% of Colombia's students, only 30% of students choose a VET program.
- Secondly, not all graduates who have chosen a VET education have the competencies and qualifications needed to fill the gap in the labor market.

Both issues are interconnected and are caused by various problems within the VET programs as well as in the Colombian education system in general. To understand the interconnection of these issues, we first need to take a look at the structure of the tertiary education system including ETDH focusing on the VET programs.

The results paint a clear picture of the tertiary education sector, which has two parts: the higher education and ETDH. While Figure 2 gave an overview over the programs in the higher education sector as well as in the ETDH sector, Figure 3 shows the different institutions involved in VET programs in the tertiary education sector and their relations with each other.

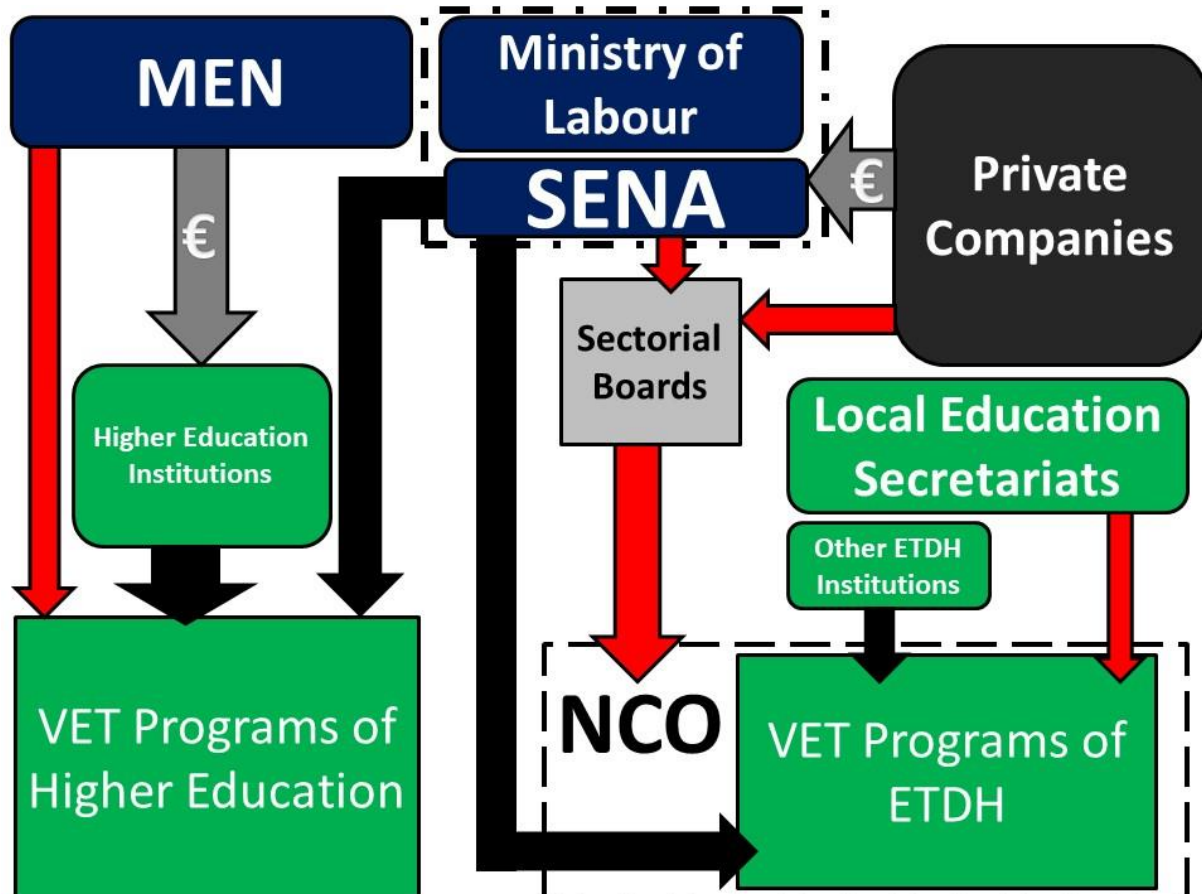


Figure 3: the different actors in the tertiary education sector including ETDH.

The tertiary education field is not displayed in its full complexity, but we can see the institutions and their relations which are the most important for the context of VET. The relations are represented by three different types of arrows. Black arrows represent providing educational programs, red arrows represent supervision and control, and gray arrows represent finance. SENA is the actor with most arrows, as it is the only institution linked to the higher education sector as well as to the ETDH sector. In both sectors, SENA is the biggest provider of VET programs. However, the role of SENA is very different in each of the two sectors. In

the ETDH sector, SENA has a double role: it provides the main share of the educational programs and at the same time sets the rules of the curriculums for all VET programs in this sector. The rules are set through the NCO, which is developed under the leadership of SENA. The NCO can be understood similarly to the *Ausbildungsordnung*¹ in the German system. The NCO is worked out by the sectorial boards. These boards consist of experts from SENA, experts from other government organizations, and experts from the private sector. This group of experts identifies the competencies and abilities needed by professional workers in each sector; for example, the competencies a professional automotive technician needs on his job. Based on this outcome, SENA develops the NCO document for each occupation. This document gives specific goals for the VET programs in the form of competence expectations as well as key contents. These guidelines must be followed by all institutions offering VET programs in the ETDH sector.

In the higher education sector, the institutions do not have to follow the NCO. Yet, SENA's *tecnólogo* programs, which are officially part of the higher education, follow the NCO as well, which will be further discussed as an issue of standardization. While SENA defines the guidelines in the NCO for the VET programs in ETDH, the local education secretariats have to authorize educational institutions to offer a VET program in the ETDH sector. The local education secretariats are assigned this responsibility by the national law and the MEN. The MEN itself does not support the local authorities in the execution of this task.

Figure 3 shows that the higher education sector is organized differently than the ETDH sector. The programs are directly supervised and controlled by the MEN. The VET programs in this sector are provided by SENA and many other higher education institutions. As the chart

¹ The German dual VET programs are regulated by two curriculums. The *Ausbildungsordnung* regulates the part of the program conducted in the companies and is worked out in a standardized cooperation process between the public and the private sector. The lessons in the VET schools are regulated by another curriculum which again is aligned with the *Ausbildungsordnung*. (Schelten, 2010, pp. 66-67)

shows, SENA is not - like the other institutions - dependent on the MEN but belongs to the Ministry of Labour. SENA itself legally is not a higher education institution but its *tecnólogo* programs are part of the higher education sector, giving the graduates of SENA's programs the same title as the graduates from other *tecnólogo* programs.

6.1 The Problematic Image of Vocational Education and Training in Colombia

Looking at the results, it is easy to understand why only a small proportion of students chooses to start a VET program: VET programs have the reputation to be bad education for poor people. This conception makes VET very unattractive for students and their families and seems to be strongly embedded in the Colombian society, pushing everyone who can afford a university education to choose it over a VET program.

6.1.1 Education for poor people.

In fact, the results also show that the students in VET programs come from vulnerable socio-economic backgrounds and have low possibilities of entering a university program. But it is not only the students who want to go to university rather than to a VET program, it is also the understanding of VET in Colombia in general. When asked about the characteristics of VET many experts stressed that VET is education for work and only enables students to fulfill a very specific task but does not give them broader competencies. Therefore, for them, VET has a much lower standard than academic education. This conception is very different from the conception of VET in Germany. The German stakeholders as well see VET as education with an applied focus. Nevertheless, dual VET programs in Germany aim to give the students general competences not only to be specialists in their field but also to be more flexible on the labor market.

6.1.2 Better a bad university than a good VET institution.

VET is not only unattractive for the students and their families but also for the educational institutions themselves. The results suggest that institutions that offer VET

programs like *tecnólogos* want to distance themselves from the image of vocational education and want to be seen rather as universities or even try to officially become universities. One reason for this is that the institutions want to distance themselves from the bad image of VET. Another reason, as the results suggest, is that the incentives for educational institutions to become universities are much higher than the incentives to concentrate on becoming a high-quality VET institution. Offering VET programs, the institutions have to compete with SENA, which has a much bigger budget and offers all courses free of charge for the students. On top of that SENA sets the rules for the ETDH sector through the NCO and has a monopoly on the institutional connection to the private sector, with the *contrato de aprendizaje*. We will have a closer look into the problems of different standards in Chapter 6.2 on standardization.

6.1.3 Reasons for the low attractiveness of VET.

The problematic image of the VET in Colombia seems to be the main reason why students prefer university careers over VET programs and gives a first explanation for the gap in the Colombian labor market. However, we have to see this problem in the context of the overall situation and in connection with its causes. According to the results, there are different reasons contributing to the bad image. One of them is the value of VET degrees in the labor market. Following the results companies are not paying their employees according to their productivity but rather according to their degree, leaving VET graduates with much less money than university graduates and therefore making VET programs less attractive.

This situation seems paradox in light of the shortage of skilled workers in the Colombian labor market. One would expect that companies are willing to pay higher salaries to VET graduates, being in need of people with this type of qualifications. On the one hand, this can be explained by the bad image of VET degrees in the private sector. On the other hand, the reason for the lower salaries might be connected with the belief that vocational education in Colombia has a low quality. This belief is another reason for the bad reputation of VET programs in

Colombia society, explaining also why companies are not willing to pay higher salaries even though they need people with quality vocation training. However, results clearly show that VET programs in Colombia are not generally of bad quality, but nevertheless, there are many quality-related challenges.

These challenges can be categorized in two groups: challenges which have a negative impact on the quality of education, like low-quality teaching; and challenges of standardization, like fundamental differences in curriculums of programs leading to the same title. The challenges of the second group do not necessarily have a direct impact on the quality of the education. Two VET institutions can teach different contents and even work with completely different methodologies and still both program can have a high quality. Nevertheless, a lack of standardization makes it hard for other stakeholders to identify the quality of the program. How should a company recognize the skills and competencies of a graduate if there is no standardized exam to achieve a certain degree or title? We will look at this lack of standardization before we discuss the other problems which, according to the results, have a negative impact on the quality of the VET programs.

6.2 The Lack of Standardization and Control

In Germany every VET program is standardized through a curriculum for the VET school and through a curriculum for the training in the company. Both regulations are interconnected and worked out in a cooperation of the education sector and the private sector. The education of every student in a certain program will follow these standardized plans no matter which VET school the student attends or in which company he is employed. This way employers know which competences a person with a certain degree has and students can figure out their chances on the labor market before starting an education. However, the structure in Colombia is different. The private sector does generally not participate in the educational processes, leaving the education of the workforce to the educational institutions. These

processes are supposedly standardized through legal regulations and the control of those by the responsible government institutions, but the results suggest that this standardization is insufficient. Figure 3 shows that higher education sector is controlled by the MEN while the programs in the ETDH sector are controlled by the local secretariats of education.

6.2.1 Insufficient regulations and controls.

While SENA, defining the NCO, provides guidelines for the VET programs in ETDH, the local education secretariats have to authorize educational institutions to offer a VET program in this sector. The local education secretariats are assigned this responsibility by national law and the MEN. The ministry itself does not support them in the execution of this task. The results revealed that a lack of control from the side of the local secretaries leads to low quality of many ETDH programs, suggesting that graduates from these programs often lack the skills they would need on the job. Most experts stated that the local secretariats are simply not able to conduct the controls because there are too many providers in the ETDH sector. Following this thought, it would simply come down to insufficient resources at the side of the secretariats, because with more resources more controls would be possible.

However, according to the statements of the expert from a local education secretariat it is not only a lack of resources but rather the missing legal framework. This would mean a clear mandate for the secretariat based on national law that allows them to check on the quality of the ETDH programs. The results show that even though institutions have to get a permit from the education secretariat to open a VET program in the ETDH sector the secretariat cannot significantly change the design of the programs or deny the permit on the basis of content related issues. Once a program is permitted the secretariats can execute controls at schools and institutions. But the secretariats' controls are concentrated on the administrative and organizational aspects like for example the emergency exits of the educational institutions. Hence some essential factors of education quality like the quality of teachers or the

standardization of programs are not sufficiently controlled, potentially leading to low quality of educational processes and a lack of standardization.

While SENA follows with its *tecnólogo* programs the same systematic as with its ETDH programs the other higher education institutions state a fundamental difference between their programs and the programs in the ETDH sector. In fact, the results suggest that not only have the programs in the higher education sector completely different regulation but also is the control of this standards through the MEN more effective than in the ETDH sector. For example, the standards for teachers in a higher education institution are much higher than in the ETDH sector. Teachers must have at least a postgraduate degree while a teacher in the ETDH sector does not necessarily need an academic title at all (see Chapter 5.1.5). The higher education institutions receive most of their money from the MEN. Giving the MEN much more control over the programs through the budget than the secretariats have in the ETDH sector, since according to the results the programs in the ETDH sector are paid for completely by the students directly to the institution. To offer a program in the higher education field the institutions must fulfill certain quality standards which are strictly controlled by the MEN. The results suggest that in fact, the standards of the higher education sector are higher than the standard in the ETDH sector. However, the results also suggest that these higher standards in each program do not provide a universal standardization of VET programs in the higher education sector. Even though the standards have to be met, the institutions have autonomy when it comes to the content of their programs. They can decide for themselves what they want to teach and which competencies a graduate has to have. Again, SENA plays a unique role in this field.

6.2.2 Different curriculums with the same title.

While SENA designs its *tecnólogo* curriculums based on the NCO the other higher education institutions have a very different approach regarding their *tecnólogo* programs. This

difference starts with fundamentally different education philosophies. As the results clearly show SENA's approach is based on practice-based education while the other higher education institutions see themselves as university-like institutions and put a broad scientific basis in their programs. These institutions design their curriculum according to the scientific disciplines. A *tecnólogo automotriz* student (automotive technician) at these institutions would find math, physics, material science or thermodynamics as individual subjects in his schedule. A student that does a *tecnólogo automotriz* program at SENA will not have a single lesson in these subjects. SENA's curriculum follows the *guía de aprendizaje* which is structured in thematic fields like "injections systems" or "electrical systems". In this structure the students have to fulfill very practical tasks in each field. They complete one field before they start another one, working sometimes several days just on one project. Theoretical knowledge, which is necessary for the fulfilling of a task is always taught in concrete relation to the practical task. The different approaches of SENA and the other institutions lead to completely different education programs and competencies. While the students at SENA spend most of their training on practical tasks similar to real work situations, the students in the other institutions spend most of their time in theoretical science lessons and only a small proportion of their training in practical classes. In the end, the students from both types of programs get the same *tecnólogo* title, having a completely different education.

On top of that, there are no standardized final exams to receive a certain VET title as it is the case in the German dual VET programs. In Germany the private sector designs the final exam for the dual VET programs. All students that want to graduate from a certain VET program must sit and pass the same theoretical and practical exams. (Schelten, 2010, p. 67) In the Colombian system each institution decides on the criteria for graduation. The results showed that none of the examined VET programs includes a final exam for graduation. Without a standardized curriculum and standardized exams, it is unclear which competences a graduate

with a certain degree really has. This is problematic for the employers since they don't know which competencies they can expect from a graduate with a certain title. Hence, it is also problematic for the graduates, seeking employment, since the companies might not recognize their competences. On top of that this lack of standardization creates a problem for the students who try to decide if they want to attend a VET program, as they often do not know which competencies they will receive in which program. It is logical that due to this situation many students prefer university programs over VET programs.

6.2.3 The high dropout rates in the tertiary education system.

One of the biggest problems I discovered in this investigation is the high dropout rate of students in VET programs. In programs offered by SENA as well as higher education institutions, the dropout rates are 20 % and higher. The results show different reasons for this. On one hand, the students have personal problems of financial or familiar nature which lead them to stop their education. On the other hand, students lack the skills and competencies to keep up with the VET programs, especially in the programs offered by higher education institutions. Therefore, the challenges of the VET programs have to be seen in the context of the overall education system. To enter into a higher education VET program, students must hold the *bachiller*, supposedly being sufficiently skilled with this title to master a VET program in the higher education sector. The fact that even students who hold this degree often lack basic skills in math and physics shows another problem of standardization: there is no universal test to receive the *bachiller*. However, even a standardization with such a universal test would not be sufficient to solve the problem. The basic educational institutions also need the capacities to actually reach this standard. So why do the students not receive sufficient skills in the basic education at the higher schools? The results suggest that the most important reason is the quality of teaching even though a lack of learning materials and the socioeconomic background of the students are important factors as well. Generally, there seems to be a big difference between

private and public education. Students in private high schools seem to be better prepared for higher education than students in public education.

6.3 Fitting Problems of VET Graduates on the Labor Market

The interviews suggest that the gap in the Colombian labor market consist of a lack of professionals with sophisticated vocational skills. This is to say that while there are enough university graduates with high qualifications and enough people with no education or an education on a very low qualification level the companies are in need of people in between, on a medium qualification level. To give an example from the industry it is not a lack of engineers who design a mechanical product but a lack of qualified personnel which is able to carry out the production process that was planned by the engineer. Professionals with this set of competencies should be provided by the VET programs. The low number of students in VET programs is not the only reason for the shortage of this professionals, but the results also suggest that not all VET programs provide their graduates with these competencies. Even though there are VET graduates looking for a job and companies looking for skilled workers, many vacant positions do not get filled adequately, or companies need to retrain the workers.

Consequently, it seems that the graduates do not fit the requirements of the open positions or the other way around. The results provide different explanations for this situation. Number one: some graduates are not sufficiently skilled due to quality related problems in their education, like bad teaching; number two: the graduates have professional skills on a sufficient level, but in the wrong area or even on a qualification level which is too high or too theoretical. For example, if there are many well-qualified nurses in the labor market, but the companies need skilled designers in the production of clothing.

6.3.1 Different understandings of high-quality VET.

There are different perspectives on the question of how to train students to the right qualification level to meet the needs of the companies. These different perspectives are reflected

in the differences between the curricula's in VET programs offered by SENA and the ones offered by higher education institutions. Both aim to prepare students for the labor market in their *técnico* and *tecnólogo* programs but follow fundamentally different approaches as we saw in Chapter 5.1.4. Many higher education institutions do not want to be seen as VET institutions but rather as universities. Both, SENA and the other institutions see their own approach as the better one to prepare the students for the work in the companies. The standpoint of the higher education institutions is that SENA's programs do not prepare the students sufficiently, focusing on practical competences and missing basic science. SENA's standpoint is that the graduates from the other programs lack practical competencies and do not learn how to apply their knowledge.

The position of the higher education institutions seems to be related with the problematic image of VET in Colombia which is generally seen as low-quality education. This leads to the believe that an education program can only be of high quality if it includes an academic science education. While the experts might have different definitions of the term 'education quality' the interviews revealed a common understanding of the outcome of a successful education: the programs enable the students not only to perform a specific and limited task but also to reflect on their working process and find solutions for possible problems. This outcome would supposedly fit the needs of labor market. In the light of this conception, the quality of an education program is high if the program achieves this goal and is low if it fails to do so. This definition of education quality is quite simple but reflects the understanding of the experts and allows us now to discuss how this quality can be achieved in a VET program.

According to the results the experts from higher education institutions in the technical sector assume that students cannot receive these competences without a sophisticated science education in the subjects math, physics, material science etc. Hence, they regard SENA's *tecnólogo* programs as programs of low quality since these programs do not include the subjects

but teach science only in the context of concrete practical applications. With the data collected in this investigation it is not possible to prove or disprove this assumption. However, we can take a look at the German VET system to see if this assumption is reflected in the German dual VET programs.

In German VET schools, students of the dual VET programs receive theoretical lessons as well as practical lessons, while the training in the companies focuses on practical competences. The theoretical knowledge is not organized in the different scientific disciplines like math or physics but in thematic fields. For example, the thematic field “repair of transmission components” in the curriculum of an automotive technician. These thematic fields do not only include theoretical knowledge but training in the practical application of this knowledge as well. Hence, the theoretical content is always connected to its application in the field. The main goal of the German VET schools is defined as:

[...]to promote the development of comprehensive job-related and inter-professional skills. This enables the students to fulfill the specific tasks in their profession as well as to shape the working world and the society in social, economic and ecological responsibility, especially against the background of changing requirements.² (Bayerisches Staatsministerium für Bildung und Kultus, 2015, p. 5)

This definition includes the already discussed quality criteria and the main goal of VET in Colombia as it was mentioned by many experts: the students should not only be able to fulfill specific tasks but develop skills which allow them to solve problems like changing technologies in their occupational sector.

In conclusion, the German dual VET system, which all interviewed experts mentioned as a role model for high-quality VET education, has more similarities to SENA’s approach than to the more academic *tecnólogo* programs of the higher education institutions. This does not mean that SENA’s program do not have fundamental quality issues, as we will see in the next

² Translation from German to English by the author.

chapter. However, the comparison with the German system does contradict the assumption that academic science education is a necessary precondition for sophisticated vocational competencies.

Of course, the students in the *tecnólogo* program of a higher education institution receive a deeper knowledge of natural science than the students in SENA or in a typical German dual VET program. However, they also have far fewer competences in applying their knowledge in practical working processes. These students might still be well qualified for positions in the Colombian industry, but this does not solve the lack of medium qualifications in the labor market. For example, a student which graduated as automotive *tecnólogo* from a higher education institution will probably not fix broken cars in a workshop but will more likely work in a coordinating position in this workshop. The problem is that VET also needs to provide a comprehensive education for the personnel which is actually repairing the cars, thereby improving the productivity. Hence, the students in the *tecnólogo* program of a higher education institution receive a comprehensive academic education and might find an adequate job but do not fill the gap of vocationally skilled personnel in the Colombian labor market. Companies are more likely to employ on the level of university graduates, with a lower salary.

6.3.2 Education of teachers as main challenge for VET in Colombia.

The results suggest different challenges regarding the teachers in the VET sector. VET teachers need a broad education in their subject as well as in pedagogy which is not met by the basic requirements to become a VET teacher in Colombia, even though there are big differences in these requirements between the educational institutions. While teachers in the higher education sector need to hold a postgraduate degree their colleagues in the ETDH sector do not have to have a higher education degree at all. The results indicate that SENA's teachers lack basic skills, sometimes even having problems with math and languages themselves. On top of that corruption and other political issues are responsible that people are employed as teachers

which are fit for the job. This is a vicious circle: if teachers themselves miss basic competencies they cannot be expected to provide high-quality education to their students. On top of that, the results suggest that the quality problem also exists for Colombia's high schools, leaving students already with insufficient qualification before they even start a VET program.

Teachers in VET programs have to be experts not only in their occupational field (for example automotive technology) but also in pedagogy and didactics. Even though many educational institutions have highly qualified teachers, they face this problem. In difference to Germany Colombia does not have standardized education for VET teachers. In the German system VET teachers need to have practical experience in their occupational field as it is the case in Colombia as well. On top of that the German VET teachers have to hold a master's degree in vocational education, providing them with sophisticated knowledge in their occupational field as well as in pedagogy, didactics, and psychology. After finishing this theoretical career, they have to absolve a two year of practical training in teaching (a two-year fulltime teaching training, run by the government and conducted at a school where the future teachers already have to teach).

The results showed that it is exactly this combination of sophisticated theoretical knowledge and practical skills in teaching as well as practical experience in the occupational field, which is hard to find in Colombia. On top of that, the profession of teacher in general is not attractive for Colombians, which makes it even harder to motivate well-qualified people to work in this sector if they get higher salaries and more prestige in other fields. This lack of adequate VET teachers is another reason for the fitting problems of the VET graduates on the Colombian labor market. Especially since the VET education does nearly exclusively take place in the VET institutions and not in the working spaces of companies. All the practical competencies the students need for their job therefore must be thought in the VET intuitions,

leaving the teachers with a challenging task which they can hardly fulfill without an adequate training.

6.3.3 Lack of communication with the private sector.

To teach students the skills and competencies they need on the labor market, the educational institutions have to know which skills and competences this are – they have to communicate with the private sector. Figure 3 shows the private sector as one of the stakeholders in the tertiary education system. Nevertheless, it is also clearly visible in the picture that this sector does not play a central role and has no direct influence on the education in the VET programs. In fact, the results suggest that the insufficient connection and communication between the educational institutions and the private sector is one of the main challenges of the tertiary of Colombia's tertiary education system. The private sector plays a fundamentally different role in this structure than it is the case in the German dual VET system. There the industry but also small companies actively participate in the education of the students. The German students have two different places of learning: the educational institution and the company itself. The students alternate between both places and are students and employees at the same time. The lessons in the educational institution, the VET school, focus mainly on theoretical skills while the time in the company is spend on building up practical competencies. In the Colombian system the students are supposed to gain all the theoretical and practical skills in the educational institution. Although the Colombian students as well have the possibility of spending six of a *técnico* or *tecnólogo* program in a company, this is a very different approach. The so-called *contrato de aprendizaje* (six months of working in a company) has the character of an internship and the students can only start working in the company once they already finished their whole education at the educational institution. The time spend working in a company is only one of several options which students of VET programs can choose to receive their degree. The students can instead choose other options like writing a thesis. So, they are

not obligated to work for a company to receive their VET degree. On top of that the results suggested that not all private companies are interested in taking in students for these internships. Even though companies are legally bound to take in a student from SENA, companies often choose to pay an additional amount of money rather than doing so. The other educational institutions have to find companies that are willing to take their students voluntarily or cooperate with SENA in order to do so.

According to the results the only government-run connection between the public sector and the educational institutions is the NCO. The NCO provides a link between the ETDH sector and the labor market but faces several challenges as well: firstly, the NCO does only cover the ETDH sector and not all the programs of higher education sector. Secondly, the programs in the ETDH sector are not sufficiently controlled for their quality. Even though the NCO provides certain standards for these programs, there is no control which makes sure that those standards are met. Thirdly, the results suggest that many companies are not interested in cooperating with SENA on the NCO due to bad experiences they had with the institution in the past. The active participation of the private sector is essential for the NCO. In order to know which skills are needed on the labor market, the process depends on the input of the private sector. Experts from the companies not only have to provide information about the skills that are presently needed but also predict changes of those needs for example due to technological advances. Without this input the NCO cannot fulfill its purpose and the programs do not provide the students with the skills the companies need. The results suggest that this is the case in many sectorial boards because many companies do not put a high priority on the participation in this process.

Except for the NCO, the Colombian private sector has no direct influence on the curriculums. But interviews suggest that educational institutions might have individual links to the private sector. Especially in Antioquia educational institutions, the public sector, and the private sector started cooperating with each other in a structured way. Antioquia seems to be a

role model for Colombia's national development in this regard nevertheless, there is not yet a standardized way for all institutions to get systematic input from the private sector for the design and the updating of their curriculums. This also has to do with the general structural and political problems.

6.4 Institutional Challenges and Obstacles to Reform Approaches

Figure 3 shows different government institutions on national and regional level and their role in Colombia's tertiary education system in its current design. On top of these responsibilities the MEN is in charge of reforming the education system if necessary. The government is aware of the many challenges in the education sector. The OECD gave several recommendations for the reform of Colombia's education system which the government tried to implement. In fact, Colombia already made great progress in some fields but also faced backlashes in its reform plans on national level. An example of such a backlash is the reform of the tertiary education sector and the unsuccessful attempt to introduce the SENT. However, the progress on the regional levels in Medellín and the department of Antioquia in many aspects seems to be a positive example for the rest of the country, as the results showed with the example of the *media técnica* in Medellín's public schools.

To successfully develop and implement reforms, reliable government institutions are an important factor. Before we take a look at the reform of the tertiary education sector we need to get an overview of the conditions of the Colombian institutions in the education sector.

6.4.1 Corruption and bad governance.

The results suggest that corruption is a major problem in Colombia's government institutions. SENA seems to be especially vulnerable to corruption because of its big budget and its employment structure. Most employees of SENA have short-term contracts of only one year. According to the results, these contracts are regularly used as an instrument of corruption, given not to the best-qualified person but to the one serving best the personal interest of the

person giving out the contract. This is especially problematic since positions with a high influence on the development of the institutions for example leading positions in SENA are given to people with no expertise as well. This phenomenon of putting personal interest before the interest of the public does not only influence staffing choices but political decisions in general. Hence, important decisions are made not according to the goals or long-term strategy of the institutions but according to the interests of a private person. In this way, corruption does not only undermine the quality and efficiency of the institutions and their work, due to the employment of insufficiently qualified people, but also undermines further development and reform approaches.

This form of corruption does not only hinder the effective work and the development of the institutions, but also minders the trust of the people in these institutions. This again makes it harder to successfully reform a system. The tertiary education sector in Colombia contains many different stakeholders with different interests. Without a basic level of trust of these stakeholders in the public intuitions, they are less likely to participate in the process of the reform and will even try to block it, as it happened in the case of the SNET.

However, not only corruption is problematic for Colombia's institutions, but the results suggest that other general organizational challenges reduce their efficiency too. The first is a lack of continuity due to a high staff fluctuation in the institutions including political positions. For example, the many personnel changes in the MEN, including the position of the minister itself, have a negative impact. Changes in high positions often lead to changes in strategy, which in itself do not necessarily have to be negative. However, if the strategy is changed too often continuous processes and reforms are hardly possible. This is especially problematic in the light of the already mentioned challenges in term of standardization and control. To overcome these issues the government must reform the system in a comprehensive way. Implement such reforms, is difficult without a certain political and strategic continuity. On top of that other

stakeholders, like educational institutions or companies, are likely to lose trust in the institutions, which makes it harder to include these stakeholders in reforms. This inclusion again is essential for the reforms to be successful.

Another organizational challenge, mentioned in the results, are communication problems within the institutions. Even though SENA has strong links with the private sector, information, won out of these contacts, does not reach even high-level employees in SENA. Therefore, those employees act without considering this information or are not able to make informed decisions at all. Structural challenges like this might lead to substantially wrong decisions and undermine the reputation of SENA, contributing to the situation that parts of the private sector do not want to cooperate with SENA anymore as we saw in the results.

6.4.2 The effort to create one system.

The most fundamental problem is the lack of a systematic overall structure in Colombia's education sector. Different sectors can be seen as sub-systems which are regulated by different government organizations following different regulations. On top of that the autonomy of educational institution and the insufficient communication with the private sector make the education system seem unorganized. This is especially apparent in the transition from one part of the system to another; for example, from the *educación media* to a VET program in higher education. Students are in danger of ending up in impasses, dropping out of programs or have difficulties to navigate the education system due to unclear structures.

The government's approach to fix this problem by creating a National System for Tertiary Education (SNET) which would include university education as well as VET programs, failed. The results suggest, the main reason was the opposition from the universities. They did not support the reform, on one hand because of the way the government tried to implement it: many stakeholders felt the process was not inclusive and that their positions were not taken seriously. On the other hand, the results suggest that especially institutions from the

higher education sector oppose the reform because it would decrease their autonomy and undermine the value of their programs. Especially universities seem to be against a structure, which puts their programs on the same level as vocational or technical programs, being afraid that this undermines the value and reputation of their own programs. Here again, we can see the impact of VET's low reputation in Colombia.

The core of this system was planned to be a national qualification framework which would standardize all education programs and create links between higher education and technical education. Even though the introduction of SNET failed, qualification frameworks were introduced for some occupational sectors in cooperation between the government, educational institution, and the private sector. This is an important step forward, but since the existing frameworks are not binding for the design of the programs they do nothing for the standardization.

6.4.3 The dual VET as a model in Colombia.

As we clearly saw in the results the German VET system is well known in Colombia and enjoys a high reputation. The experts agreed that a dual system is the best format of VET. The results showed that the German dual VET system is seen as a role model for successful VET education by all experts. This positive image seems to be based mainly on the fact that German VET students are integrated in working processes at the companies. It is exactly this connection to the private sector which seems to be the biggest challenge for the implementation of a dual VET system in Colombia. While SENA already works in a number of projects with companies on a dual VET system, it is not happening on a broad scale. Most companies are not willing to participate in the education of their workforce in a dual VET system. The results also suggest that the experts think of dual VET programs mainly in cooperation with big companies but not with small businesses as it is the case in Germany.

While the companies are legally obligated to cooperate with SENA in the *contrato de aprendizaje* the other educational institutions have problems to find companies to cooperate with them. The introduction of a dual VET system on a broad scale is a huge challenge. The basis of such a system is the cooperation between the private sector and the public educational institutions. A standardized framework would have to be developed in cooperation with the private sector and the educational institutions. However, as long as companies are not interested in participating in the education of their workers in a systematic way this is not possible. Looking at the fundamental differences between the didactical concept of SENA and the higher education institutions, it is SENA's concept which is more similar to the German vocational schools, while the curriculum of the higher education *tecnólogos* is more similar to dual university programs that are offered at German universities of applied science.

7 Limitation

Although the research for this study was carefully conducted and reached its aims we have to be aware of its limitations. This study has explorative character and was conducted exclusively with qualitative methods. Both research methods used in this study – interviews, and observations – might be vulnerable to the influence of subjective opinions. This includes on one hand my own opinions and observacions. Even though I gave my best to be objective my observacions may have been influenced by my own cultural and educational background which includes a dual VET training in Germany. Regarding the interviews this also includes the subjective opinions of the experts. Experts who work for educational institutions might have an interest in making this institution look good, and therefore emphasize their achievements more than their problems especially since some of the experts represented competing institutions.

Another point is the pedagogical culture. The relationship between teachers and students in the observed lessons were quite sympathetic and sometimes even seemed to be close to friendships and most students seemed to be very proud of the educational institutions they were studying in. Hence, in conversations conducted during the observations students might not have answered in a way which they think make their teachers or their school look bad. On top of that, my presence might have influenced the structure of the lessons, since the teachers knew in advance of my visit.

Finally, all observations were conducted in education intuitions in the urban area of Medellín. It is likely that institutions in the rural areas have different problems and less resources, so that the results of this investigation might not apply in the same way to other more rural areas in Antioquia.

8 Conclusion and Recommendations

The goal of this study was to describe the structure and the main challenges of VET in Colombia in order to understand why Colombia's VET programs so far failed to fill the gap of skilled workers on the labor market. The structure itself is in many regards the first challenge since it does not provide a sufficient standardization. The government's approach to reform the structure of the tertiary education sector was not successful, leaving a tertiary education sector divided in ETDH and higher education with different standards for VET programs in both sectors and without a shared understanding of what vocational education and training is.

Programs which are rewarded with the same title have completely different curriculums. VET programs offered by higher education institutions have a high standard of teaching quality, but their curriculums are more similar to university programs than to VET programs, leaving the graduates with an academic education but not with the vocational competencies needed on the labor market. Programs offered by SENA concentrate on the practical competencies of the students but face problem regarding the quality of teaching. The main challenge seems to be the formation of the teachers. The minimum requirements for teachers in SENA are much lower than at Colombian higher education institutions or at German VET schools. This includes less background in theoretical knowledge of their field, in theoretical knowledge of pedagogy and didactics as well as a practical preparation for the real classroom situations.

These quality issues contribute to the problematic image of VET in Colombia. Students regard VET as low-quality education for poor people and only around 30% of the students entering the tertiary education system chose a VET program while 70% chose to study at a university. Meeting the skills which are needed on the labor market requires continued communication between the companies of the private sector and the educational institutions. While the results clearly show that dual VET programs, as they exist in Germany, are regarded

as a solution for this problem the companies are generally not yet willing to participate in the education processes as it is necessary for such a system.

In cooperation with stakeholders from the region of Antioquia the TUM School of education could help to take on the challenges identified in this study. In my opinion two fields are especially interesting for such a cooperation: the education of teachers and the introduction of dual VET programs. Regarding the formation of teachers, the results showed that VET teachers need to fit diverse requirements. However, in Colombia no standardized program for the formation of such teachers exist. The TUM School of Education is an expert in this field, not only participating in the formation of German VET teachers but also doing research in order to continuously develop these formations. Therefore, further research should be conducted on the question how the formation of VET teachers in Colombia could be improved and if elements of the German system might serve to do so. Regarding the cooperation between the private sector and public educational institutions in dual VET programs, the question is if the concept used in Germany could equally work in Colombia or which aspects would have to be altered to fit the requirements of the countries cultural, institutional and economic circumstances.

Many Colombians understand the expression 'education for work' as a synonym for low-quality education, choosing to go to university if they can, or just working under precarious conditions in the informal sector. Changing this conception into a positive image of VET can only work if the graduates of this programs are valued more highly – both: socially and financially. The key to achieve such a change is ensure that the VET programs lead to comprehensive vocational competencies which meet the requirements of the labor market, giving the graduates access to formal and financially attractive employment. A first step to achieve this is the standardization of the tertiary education sector through a national qualification framework. Even though the national government's attempt to do so failed, the result showed that progress was made in the region of Antioquia and especially in the city of

Medellín as the example of the *media técnica* illustrates. To be successful these reforms need continuous and strong leadership from Colombia's public institutions, which also means overcoming corruption and building up trustful relationships between the different stakeholders.

If this approach is successful, vocational education and training will play a critical role in Colombia's economic and social development, increasing productivity and allowing people from vulnerable backgrounds to profit from the economic development. In creating a more inclusive economic development vocational education and training can promote trust in the public institutions help the country on its way to a long-lasting and prosperous peace.

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Education is the most powerful weapon which you can use to change the world.

Nelson Mandela

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Annex A

Proposal Summary

As part of the cooperation between the School of Education of the UdeA and the TUM School of Education (Technical University of Munich), I am investigating de vocational training in Antioquia. The goal of the TUM School of Education is to get a clear picture of the current situation of vocational training in Antioquia. This investigation is carried out as a Master thesis and presents a first step for possible future engagement of the TUM School of Education in this field and further cooperation with local stakeholders.

The goal of this exploratory investigation is to describe the current state of vocational training in Antioquia and find out the most pressing challenges that exist in this field. In addition to the analysis of existing data and literature, the research will be carried out using two qualitative methods. To get an integral picture, these methods are designed to cover the institutional level as well as the actual process of teaching and learning itself.

Method one: Guided interviews with relevant experts

Goal: Generate information on the vocational training on institutional and programmatic level.

Procedure: Qualitative interviews with several people, who have expert knowledge about the current institutional conditions and structures of vocational training in Antioquia, following a half-standardized interview guide.

- 1) The structure of vocational training in Antioquia
 - a) What is your understanding of vocational training?

SENA's Definition: In this context vocational training is to be understood as *"the formative educational process, both organised and systematic, through which people acquire and develop specific or transversal work-related competencies throughout their lives, related to one or several occupational fields referred to in the National Classification of Occupations, which allow the individual to exercise a productive activity as an employee or entrepreneur either individually or collectively"* (Decree 2020 of 2006).

- b) Institutional Level:
 - i) Is the vocational training in Colombia standardized? How?
 - ii) Which institutions are active in the field of vocational training?
 - iii) How are the different Institutions of vocational training related to each other and do they work together?
 - iv) How is the curriculum for the programs in the field of ETDH standardized and controlled?
 - (1) What is the role of the secretariat of education?
 - (2) What is the process if an institution wants to offer a new program?
 - (3) Which standards are the basis for the control of these programs?
 - (4) How are the curriculums related to the national qualification frameworks?

- c) Programmatic Level: (Auxiliary/Operator, Technician, Technological specialization, Technologists, Technical focus)
 - i) What are the main objectives of the vocational programs that are offered as part of the educación media?
 - ii) How are these objectives translated into the structure of each program?
 - d) Different places of Learning: (Schools, working places)
 - i) Which places of learning exist in each program?
 - ii) How much time is spent at each place of learning?
 - iii) What is the specific goal of the learning process that takes place at each place of learning?
- 2) Challenges and problems in the field of vocational training in Antioquia
- a) What are the main challenges the Colombian education system is facing in general?
 - b) How do challenges in other educational levels affect the vocational training?
 - i) Why do students often lack basic skills even though they successfully graduated from the educación media?
 - c) What are the political challenges in the field of education?
 - d) What challenges are there especially in the field of vocational training?
 - i) How are the teachers, who teach in the vocational training programs qualified?
 - ii) How attractive are the vocational programs compared to other ways of education in Colombia?
 - iii) Do the taught skills meet the requirements of the labor market?
 - iv) Do the different providers of vocational training meet the same standards?
 - e) Anything else?

Method two: Analysis of the learning process through observation

Goal: Generate information on the quality and circumstances of teaching and learning processes.

Procedure: Visits to different relevant educational institutions and collection of relevant data through observation protocols.

- Guided tour through the institutions.
- Observation of several lessons at each institution including short conversations with the students and teachers regarding the lessons.

Annex B

Example of an interview transcript in Atlas.ti

specific sector and is more hands on. Like applied education, that will allow you to go straight to a job, more easily and will give you more tools and, yes basically tools. Yes, hands on education is the phrase that will define vocational education.

- 12 It is interesting, because SENA connects their definition to the National Classification of Occupations. One of the programs that the current government was trying to develop, was a national qualification framework. Because the qualification framework will easily direct the proposals of the different programs. Not only on the vocational level but on the professional level. And you will be clear of what kind of competences you will be getting if you are going in a program. Which at this point is not clear at all not even on the vocational training nor on the university training. Like you go to university and you don't know what is it that you are going to be able to do with what you are getting and what level of autonomy you have in taking decisions.

- 13 *So there doesn't exist such a framework at all at the moment?*

- 14 Yes, so that was part of the OECD recommendations. One of the recommendation here was to build a tertiary education system, that will somehow organise what is going on, on the vocational education and the university education. And the ministry of education built (I used to work there that's why sometimes I spoke as we, because I used to be part of the government) we put together a qualification framework for the ICT-sector and now there are other sectors who have the qualification frameworks: There is culture, agriculture, logistics, health there was actually one for programs related with early childhood education. So at this point I think there is then

✘ Structure_SENA_programs

✘ Structure_Q-Framework~

✘ Challenge_unclear strucutres~

✘ Structure_Tertiary_Education-5

✘ Structure_Q-Framework~

Example of an observation transcript in Atlas.ti

07

08 The visit to the SENA Centro de Tecnología de la Manufactura Avanzada began with a tour by the director through all departments of the institution. The first department was the department of computer science and communications technology.

09 The institution is spacious and structurally very open. The education centre of SENA seems to be very well equipped. Thus, the centre has numerous facilities of Festo and many other companies. Numerous CNC controlled devices are available in the field of machine construction.

10 General information:

11 Classes take place in three shifts: 6:00 - 12:00, 12:00 - 18:00, 18:00 - 22:00. This makes it possible for the students to work during the day and attend the training in the evening.

12 According to the director, the students of the institution come from the socio-economically poorest groups of the country: 1 - 3 stars. The training at SENA is completely free for the students. Many classes are noticeably small, with about 10 to 20 students. According to the director, this is because many students do not complete their education so that the classes shrink in the course of the education. On average, it were about 15-18% of the students who do not complete the training. This is a problem, according to the director. As a reason for the departure of the students, the director states that in many cases they prefer to work to support their families.

13 The training is divided into trimesters (three months each). One year consists of four trimesters.

 School_organisation

 Challenge_DropOut

 School_organisation

English:

Declaration of Authorship

I hereby declare that the thesis submitted is my own unaided work. All direct or indirect sources used are acknowledged as references.

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German:

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