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Chair of Education Systems

Factbook Education System: Brazil

CES Chair of Education Systems

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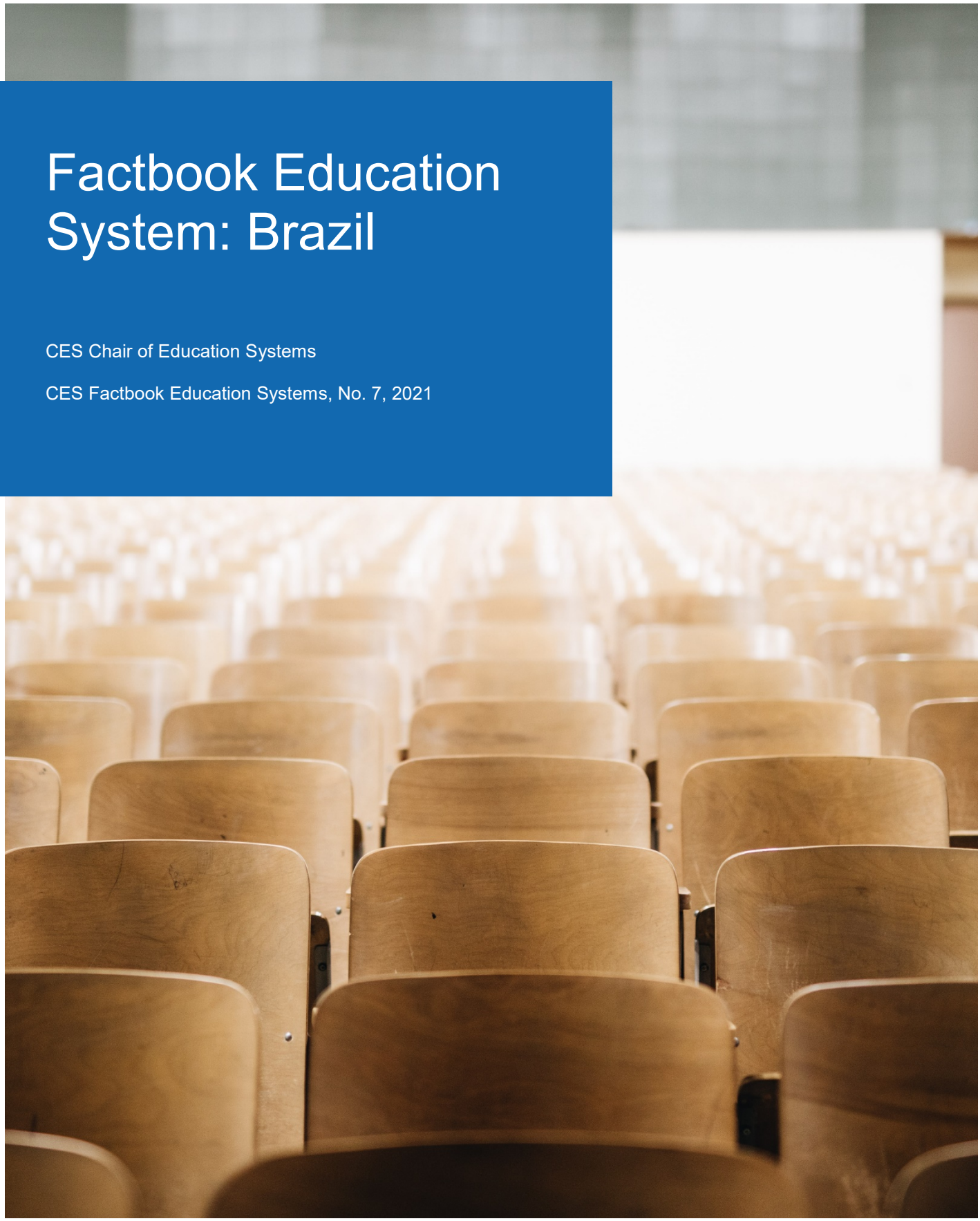

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Editing and Acknowledgement

This Factbook was edited by Filippo Pusterla. We want to thank Janosch Koeferli for the elaboration of the contents.

Contents

List of Abbreviations

CBO	Classificação Basica de Ocupações (Basic Classification of Occupations)
CNCT	Catálogo Nacional de Cursos Técnico (National Catalogue of Technical Courses)
CONIF	Conselho Nacional das Instituições da Rede Federal de Educação Profissional, Científica e Tecnológica (National Council for the Federal Network of Vocational, Scientific and Technological Education Institutions)
CPI	Corruption Perception Index
ECEC	Early Childhood Education Care
EIU	Economist Intelligence Unit
ENEM	Exame Nacional do Ensino Médio (National High School Exam)
EODB	Ease of Doing Business
EU	European Union
FIC	Formação Inicial e Continuada (Initial and Continuing Education)
FUNDEB	Fundo de Manutenção e Desenvolvimento da Educação Básica (Fund for Maintenance and Development of the Basic Education)
FUNDEF	Fundo para Manutenção e Desenvolvimento do Ensino Fundamental (Fund for Maintenance and Development of the Fundamental Education)
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GER	Gross Enrolment Rate
GII	Global Innovation Index
HEI	Higher Education Institution
INEP	Instituto Nacional de Estudos e Pesquisas (National Institute of Studies and Research)
ISCED	International Standard Classification of Education
KOF	Swiss Economic Institute
LAC	Latin America and the Caribbean
MEC	Ministério da Educação (Ministry of Education)
MPI	Multidimensional Poverty Index
MTE	Ministério do Trabalho e Emprego (Ministry of Labour and Employment of Brazil)
NER	Net Enrolment Rate
OECD	Organisation for Economic Co-operation and Development
PET	Professional Education and Training
PISA	Programme for International Student Assessment
PNQ	Plano Nacional de Qualificação (National Qualification Plan)
R&D	Research and Development
SISTEC	Sistema Nacional de Informações da Educação Profissional e Tecnológica (National Information System for Vocational Education and Technology)
VET	Vocational Education and Training
VPET	Vocational Professional Education and Training
VPETA	Vocational and Professional Education and Training Act

WB	World Bank
WEF	World Economic Forum
YLMI	Youth Labour Market Index

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Foreword

The increasing competitiveness of the world economy as well as the high youth unemployment rates after the worldwide economic crises in 2008/9 have put pressure on countries to upgrade the skills of their workforces. Consequently, vocational education and training (VET) has received growing attention in recent years, especially amongst policy-makers. For example, the European Commission defined common objectives and an action plan for the development of VET systems in European countries in the Bruges Communiqué on Enhanced European Cooperation in Vocational Education and Training for 2011-2020 (European Commission, 2010). In addition, a growing number of US states and other industrialized, transition, and developing countries (for example Hong Kong, Singapore, Chile, Costa Rica, Benin and Nepal) are interested in either implementing VET systems or making their VET system more labour-market oriented.

The appealing outcome of the VET system is that it improves the transition of young people into the labour market by simultaneously providing work experience, remuneration and formal education degrees at the secondary education level. If the VET system is optimally designed, VET providers are in constant dialogue with the demand-side of the labour market, i.e. the companies. This close relationship guarantees that the learned skills are in demand on the labour market. Besides practical skills, VET systems also foster soft-skills such as emotional intelligence, reliability, accuracy, precision, and responsibility, which are important attributes for success in the labour market. Depending on the design and permeability of the education system, VET may also provide access to tertiary level education (according to the International Standard Classification of Education (ISCED) classification): either general education at the tertiary A level or professional education and training (PET) at the tertiary B level. PET provides occupation-specific qualifications that prepare students for highly technical and managerial positions. VET and PET systems are often referred to together as “vocational and professional education training (VPET)” systems.

Few countries have elaborate and efficient VPET systems. Among these is the Swiss VPET system, which is an example of an education system that successfully matches market supply and demand. The Swiss VPET system efficiently introduces adolescents to the labour market, as shown by Switzerland’s 2007-2017 average youth unemployment rate of 8.1 percent compared to 14.8 percent for the Organisation for Economic Co-operation and Development (OECD) average (OECD, 2017).

Though not many countries have VPET systems that are comparable to Switzerland’s in terms of quality, efficiency and permeability, many have education pathways that involve some kind of practical or school-based vocational education. The purpose of the CES Education System Factbook Series is to provide information about the education systems of countries across the world, with a special focus on vocational and professional education and training.

In the CES Education System Factbook: Brazil we describe Brazil’s vocational system and discuss the characteristics that are crucial to the functioning of the system. Essential components comprise the regulatory framework and the governance of the VPET system, the involved actors, and their competencies and duties. The Factbook also provides information regarding the financing of the system and describes the process of curriculum development and the involved actors.

The Factbook is structured as follows: First, we provide an overview of Brazil’s economy, labour market, and political system. The second part is dedicated to the description of the formal education system. The third section explains Brazil’s vocational education system. The last section offers a perspective on Brazil’s recent education reforms and challenges to be faced in the future.

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The Education System Factbooks have to be regarded as work in progress. The authors do not claim completeness of the information which has been collected carefully and in all conscience. Any suggestions for improvement are highly welcome!

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1. Brazil's Economy and Political System

One of the main purposes of an education system is to provide the future workforce with the skills needed in the labour market. The particularities of a country's economy and labour market are important factors determining the current and future demand for skills. Therefore, these are briefly described in the first chapter of this factbook. In addition, this chapter provides an overview of Brazil's political system with an emphasis on the education politics. Table 2 reports key statistics and information about Brazil, which are further discussed in this chapter.

Table 1: Key Statistics and Information about Brazil

Category	Outcome
Population	211 million (2019)
Area	8.5 million sq. km
Location	South America
Capital City	Brasilia
Government	Federal Presidential Constitutional Republic
Official Language	Portuguese
National Currency	Real (R$; BRL)

Source: own table based on the World Bank (2020a).

1.1 Brazil's Economy

Brazil is the ninth largest economy in the world and the largest in Latin America. The production of goods and services resulted in a gross domestic product (GDP) of US$1.84 trillion in 2019. With a GDP per capita of US$8,700, Brazil is considered a middle-income country on the verge of becoming a developed industrialised economy. Brazil's GDP per capita is slightly lower than neighbouring Argentina's (US$10,000) and significantly lower than the Organisation for Economic Co-operation and Growth (OECD) average of US$39,300 (World Bank, 2020a). Brazil's recent economic growth trajectory is characterised by a period of outstanding growth followed by an economic slowdown. Although Brazil was one of the fastest growing economies in the world from 2000 to 2012 with an average annual growth rate of over 5%, average GDP growth over the past two decades has been modest at 3.6% per year. This is mainly because Brazilian economic growth slowed in 2013 and entered a deep recession from 2014-2017, before a modest recovery with average growth of around 1.3% since the end of the recession. The main causes of the reversing growth trends were falling commodity prices and high public debt (OECD, 2018). By comparison, Brazil's neighbour Argentina grew at a rate of 2.1% per year over the same period, while the average OECD economy grew by 2.6% per year (World Bank, 2020b). Despite the recent recession and the slowdown in the country's outstanding economic growth figures, Brazil has achieved much in terms of economic growth, social progress and poverty reduction in recent years (OECD, 2018).

Table 2 shows the detailed results of the head count ratios of the Multidimensional Poverty Index (MPI) in Brazil and its neighbouring countries for 2019. The MPI considers changes in both the incidence and intensity of poverty (UNDP-OPHI, 2020, p. 6). The values for the headcount ratio displayed in Table 2

are defined as the proportion of the population living in a household which has a weighted deprivation score greater than 0.33 (on a scale of 0 to 1 with 0 being not deprived in any component and 1 being fully deprived in all 10 components). The index measures three main dimensions of poverty: education, health and living standards. In the MPI, Brazil compares favourably with some of its economically depressed neighbours, performing substantially better than Bolivia and Peru while outperforming Paraguay only by a small margin. Based on available data, Brazil performs particularly poorly in infant mortality, sanitation and drinking water but performs significantly better than its neighbours in school attendance, electricity, housing and assets.

Table 2: Head Count Ratio of the Multidimensional Poverty Index in Brazil and Neighbouring Countries, 2019

Dimension	Indicators	Brazil	Paraguay	Peru	Bolivia
Health	Nutrition	n/a	1.3	2.4	9.5
	Child mortality	2.4	0.3	0.4	2.6
Education	Years of schooling	1.9	2.9	3.3	11.6
	School attendance	0.3	1.5	2.2	3.4
Living standards	Cooking fuel	1.3	4.2	6.1	17.7
	Sanitation	3.5	3.8	6.2	20.0
	Drinking water	2.2	1.9	3.1	8.5
	Electricity	0.2	1.1	2.3	13.1
	Housing	0.6	3.7	7.1	16.8
	Assets	0.3	1.3	3.2	11.3
MPI		**0.016**	**0.019**	**0.029**	**0.094**

Source: own table base on UNDP-OPHI (2020).

Table 3 shows value added and employment by sector for Brazil and the 28 member states of the European Union (EU-28) in 2017. The Brazilian economy is strongly dominated by the service sector, which contributes approximately 73.5% of the national GDP. The industrial sector contributes 21.1% of Brazil's GDP while the agricultural sector accounts for 5.3% of the country's GDP. In the economically advanced countries of the EU-28, the agricultural sector accounts for 1.7% of the national GDP. The value added of the secondary and tertiary sectors in the EU-28 are slightly higher than those of Brazil at 22.5% and 73.2%, respectively.

Although agriculture contributes relatively little to Brazil's GDP, the sector plays an important role in the country's labour market, employing one in ten workers. As might be expected given the comparatively low importance of the primary sector for GDP, only approximately 5% of the labour force in the EU-28 countries is employed in the primary sector. While 20% of the workforce in Brazil works in the secondary sector and 71% in the tertiary sector, the figures in the EU-28 economies are somewhat higher at 23% and 73%, respectively.

Complementing the employment figures by sector for 2017,

Similarly, Brazil ranked 62nd among the 131 economies featured in the World Intellectual Property Organization's (WIPO's) 2020 Global Innovation Index (GII). By comparison, only 3 of the 18 economies in the Latin America and the Caribbean (LAC) region outperformed Brazil in innovation capability last

year according to the GII. Over the past decade, Brazil's highest GII ranking was 47th in 2011, and its lowest ranking was 70th in 2015. Strengths include high spending on education (rank 12) and a closely related strong QS World University Ranking (rank 28). Similarly, spending on research and development (R&D) was high (rank 30), leading to a relatively high ranking among global R&D companies (rank 23). Some aspects related to infrastructure are also noteworthy: Brazil ranks among the best in e-participation (rank 12) and government online services (rank 22). WIPO (2020, p. 6) highlights clear room for improvement in the categories of ease of starting a business (rank 106), general infrastructure (rank 108) and customs duties (rank 103).

Figure 1 shows the evolution of employment in Brazil by sector for the period from 1991 to 2020. The tertiary sector is the largest and fastest growing employer of the country's workforce. While slightly less than 60% of the workforce was employed in this sector at the beginning of the sample, the sector's employment share gradually increased and now adds up to more than 70%. While the relative importance of the service sector increased steadily throughout the period studied, accounting for more than 10% of the total employment over the three decades, the opposite effect can be observed for the primary sector. The secondary sector's share of total employment remained largely the same over the sample period. One thus observes a stagnation in employment in the manufacturing sector over the last three decades, while employment in the service sector has increased at the expense of employment in the agricultural sector. This economic restructuring inevitably leads to a shift in labour market demands. More specifically, the increase in services is expected to induce an increase in demand for skills such as soft skills, communication skills and customer service skills (OECD, 2018, p. 27).

Table 3: Value Added and Employment by Sector, 2017

Sector	Brazil: Value Added (%)[1]	EU-28: Value Added[2] (%)	Brazil: Employment (%)	EU-28: Employment (%)
Primary sector	5.3	1.7	9.7	4.7
Agriculture, hunting and forestry, fishing	5.3	1.7	9.7	4.7
Secondary sector	21.1	24.6	20.5	22.5
Manufacturing, mining and quarrying, other industrial activities	16.8	19.3	12.8	16.1
Of which: manufacturing	12.4	16.1	11.4	14.5
Construction	4.3	5.3	7.7	6.4
Tertiary sector	73.5	73.7	69.7	73.2
Wholesale and retail trade, repairs, hotels and restaurants, transport, information and communication	23.3	24.1	31.4	27.7
Financial intermediation; real estate, renting and business activities	25.2	27.6	9.8	3.3
Public administration, defence, education, health, other service activities	25.0	22.0	28.5	42.2

Source: own table based on OECD (2020a) and International Labour Organisation ILO (2020a); due to rounding differences, the sum of all sectors can add up to slightly more or less than 100%.

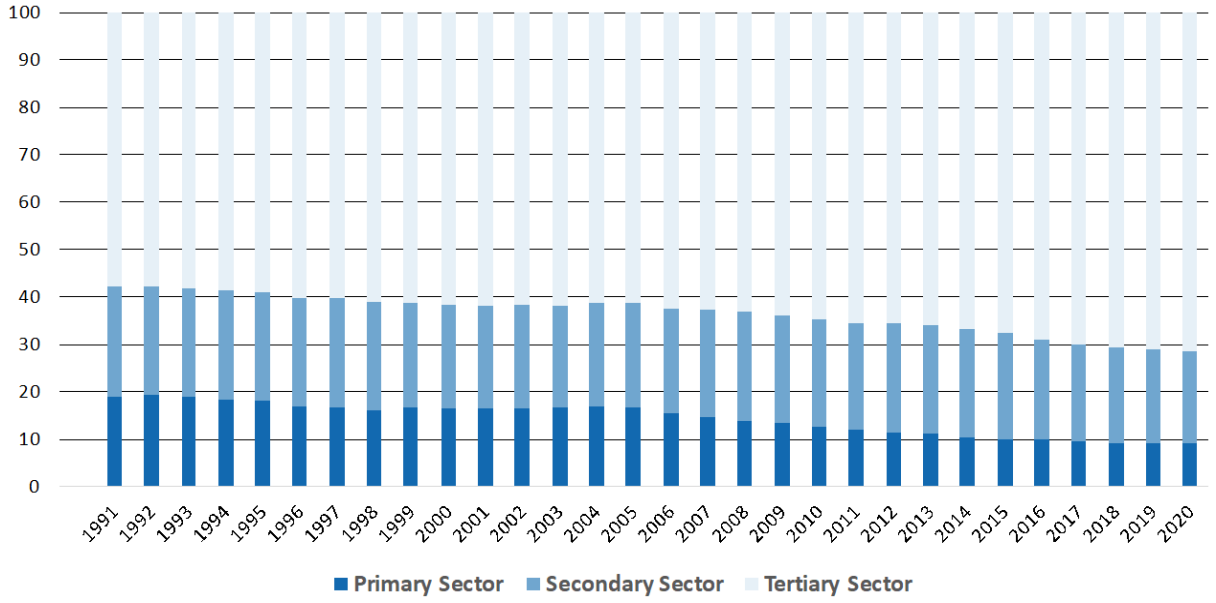
Brazil ranked 71st among 141 economies in the World Economic Forum's (WEF's) 2019 Global Competitiveness Index (GCI), which is one position higher than in the previous assessment. This increase in the GCI ranking can mainly be explained by a reduction in the high regulatory burden of opening and

[1] The source does not provide any information regarding percentage points not adding up to 100 percent
[2] Data is from 2019 Q4

closing a business, lower inflation and improved labour market efficiency. In addition to the above improvements, the report cites Brazil's comparatively high innovation capacity (rank 40) and market size (rank 10) as increasing competitiveness. According to the WEF (2019, p. 14), to increase innovation capacity, Brazil needs to drastically improve security aspects (ranked 135), government stability (rank 130), distortionary tax policies (rank 136) and trade openness (rank 125).

Similarly, Brazil ranked 62nd among the 131 economies featured in the World Intellectual Property Organization's (WIPO's) 2020 Global Innovation Index (GII). By comparison, only 3 of the 18 economies in the Latin America and the Caribbean (LAC) region outperformed Brazil in innovation capability last year according to the GII. Over the past decade, Brazil's highest GII ranking was 47th in 2011, and its lowest ranking was 70th in 2015. Strengths include high spending on education[3] (rank 12) and a closely related strong QS World University Ranking (rank 28). Similarly, spending on research and development (R&D) was high (rank 30), leading to a relatively high ranking among global R&D companies (rank 23). Some aspects related to infrastructure are also noteworthy: Brazil ranks among the best in e-participation (rank 12) and government online services (rank 22). WIPO (2020, p. 6) highlights clear room for improvement in the categories of ease of starting a business (rank 106), general infrastructure (rank 108) and customs duties (rank 103).

Figure 1: Employment by Sector (as % of Total Employment), 1991–2020



Source: own figure based on the World Bank (2020a).

1.2 The Labour Market

In the first part of this chapter, we describe the general situation of Brazil's labour market. In the second part, we focus on the youth labour market in particular.

1.2.1 Overview of the Brazilian Labour Market

The latest available data on disposable income show that incomes in Brazil are significantly more unequally distributed compared to the OECD average. More specifically, Brazil had a Gini coefficient of 0.53, while the OECD countries' average was 0.31 for the same year[4] (OECD, 2020b). Although still at

[3] This must be seen in the appropriate context of the relatively low GDP per capita and the low ratio of total government spending to GDP. Therefore, the absolute expenditure per student is less than half the OECD average (OECD, 2019a).

[4] The Gini coefficient is a standard measure of disposable income inequality that ranges from zero (all incomes are identical) to one (one person earns all income)

high levels by international standards, income inequality in Brazil has declined sharply since the early 2000s. This contrasts with the current development in most OECD countries, where inequality has significantly increased during this period (Almeida et al., 2016). This study attributes the significant improvement in poverty and inequality in Brazil during this period to the great performance of the labour market. A recent OECD report similarly attributes the reduction in inequality to improved labour market policies and additionally lists improvements in education and social transfers as facilitating factors (OECD, 2015a).

In terms of business regulation and property rights protection, Brazil's business environment did not score particularly well on the latest Ease of Doing Business (EODB) Index. Brazil ranked 124th out of 190 economies assessed in the 2019 EODB Index, which is 15 ranks lower than in 2018 (World Bank, 2019). The inflation-indexed national and undifferentiated minimum wage was recently adjusted to reflect rising prices and now stands at 1,039 Brazilian reals per month (US$258). According to the ILO (2020b), this represents a nominal increase of approximately 2% since 2019 (US$253) and about 9% since 2015 (US$237). The latest available data show that 18.9% of wage and salary workers in Brazil were union members in 2016 (ILO, 2020c), while this share was much higher in OECD countries at 23.7% (OECD, 2020a). According to the ILO (2018), 32% of the total labour force in Brazil earns its living in the informal economy, depriving them of decent working conditions, and does not contribute to individual pension systems or government revenues.

Table 4 shows the labour force participation rate for Brazil along with the OECD average for 2019. The overall labour force participation rate in Brazil is significantly lower compared to the OECD average. While the youth labour force participation rate in Brazil is almost 7.6 percentage points higher than the OECD average, the opposite is true for the adult labour force participation rate (3.4 percentage points lower). The unemployment rate in Brazil is more than twice as high as the OECD average for both youth and adults. The youth unemployment rate in Brazil was 27.8% in 2019, which is well above the OECD average of 11.7% for the same year. The female youth unemployment rate exceeded the male rate by 8.5 percentage points (24.1% and 32.6% for males and females, respectively). Such a large discrepancy was not observed in the average OECD economy, where gender unemployment rates are less than one percentage point apart (14.9% and 14.3% for males and females, respectively).

Table 4: Labour Force Participation Rate and Unemployment Rate by Age, 2019

	Labour Force Participation Rate		Unemployment Rate	
Age Group	Brazil	OECD Average	Brazil	OECD Average
Total (15–64 years)	63.9	72.8	11.9	5.6
Youth (15–24 years)	55.7	48.1	27.8	11.7
Adults (25–64 years)	75.0	78.4	9.4	4.7

Source: own table based on OECD (2020a) and ILO (2020c).

Fehler! Ungültiger Eigenverweis auf Textmarke. shows labour force participation and unemployment rates by education level for adults (those aged 25–64) for 2019. For both the OECD and Brazil, the probability of being part of the active labour force increases significantly with level of education. However, this effect is substantially stronger for the average of OECD countries than for Brazil. Analogously, the unemployment rate rapidly decreases in education level for both countries.

Table 5: Labour Force Participation Rate and Unemployment Rate by Educational Attainment (Persons Aged 25–64), 2019

	Labour Force Participation Rate		Unemployment Rate	
Education Level	Brazil	OECD Average	Brazil	OECD Average
Less than upper secondary	77.0	65.0	18.7	9.2
Upper secondary	82.2	80.8	14.9	5.5
Tertiary	90.5	89.0	7.5	3.8

Source: Own table based on OECD (2020a) and ILO (2020c).

1.2.2 The KOF Youth Labour Market Index

The KOF Swiss Economic Institute developed the KOF Youth Labour Market Index (KOF YLMI) to compare the youth labour market situation across countries (Renold et al., 2014). The foundation for this index is the critique that a single indicator, such as the widely used youth unemployment rate, does not suffice to describe the youth labour market situation adequately nor provide enough information for a comprehensive cross-country analysis. To increase the amount of information considered and to foster a multi-dimensional view, the KOF YLMI consider twelve indicators that are grouped into four dimensions (see the information box to the right).

Dimensions and the corresponding indicators of the KOF YLMI
Activity State - Unemployment Rate - Relaxed Unemployment Rate[5] - Neither in Employment nor in Education or Training rate (NEET rate)
Working Conditions - Temporary Worker Rate - Involuntary Part-time Worker Rate - Atypical Working Hours Rate - In Work at Risk of Poverty Rate[6] - Vulnerable Employment Rate[7]
Education - Formal Education and Training Rate - Skills Mismatch Rate
Transition Smoothness - Relative Unemployment Ratio[8] - Long-term Unemployment Rate[9]
Source: Renold et al. (2014).

The first dimension is the **Activity State**. It contains three indicators, and captures to what extent the youth are active. Youth refers to all individuals aged 15-24. The indicators Unemployment Rate, Relaxed Unemployment Rate, and NEET Rate, The **Working Conditions** dimension consists of five indicators that capture the quality of employment. Those are the Temporary Worker Rate, the Involuntary Part-time Worker Rate, the Atypical Working Hours Rate, the In-work At-risk-of-Poverty Rate and the Vulnerable Employment Rate. **Education**, the third dimension, aims to capture the quantity and quality of education and training via two indicators:

[5] Is calculated as the number of unemployed and discouraged workers as a share of the entire labour force. Discouraged workers have given up the search for work (not actively seeking), although they have nor job and are currently available for work (also: "involuntary inactive").

[6] Those who cannot make a decent living out their earnings. It is calculated as the number of youth at work but earning less than 60% of the median national income as a percentage of the total working population.

[7] Share of the employed population working on their own account or those working in their family business and thus contributing to the entire family income. Both are less likely to have formal work arrangements and are therefore less protected by labour laws and more exposed to economic risk.

[8] Is defined as the youth unemployment rate (15-24 years) divided by the adult unemployment rate (25+). If the youth cohort is affected in the same way than the adult group with respect to unemployment, then the relative unemployment ratio will be equal to one. If the youth are relatively more affected, then the ratio will be larger than one.

[9] Those unemployed for more than one year (52 weeks) as a share of the total number of unemployed (according to the ILO definition).

the Formal Education and Training Rate and Skills Mismatch Rate. Finally, the **Transition Smoothness** dimension describes the dynamics of the transition process between school and work. The indicators Relative Unemployment Ratio and Long-Term Unemployment Rate compose this dimension.

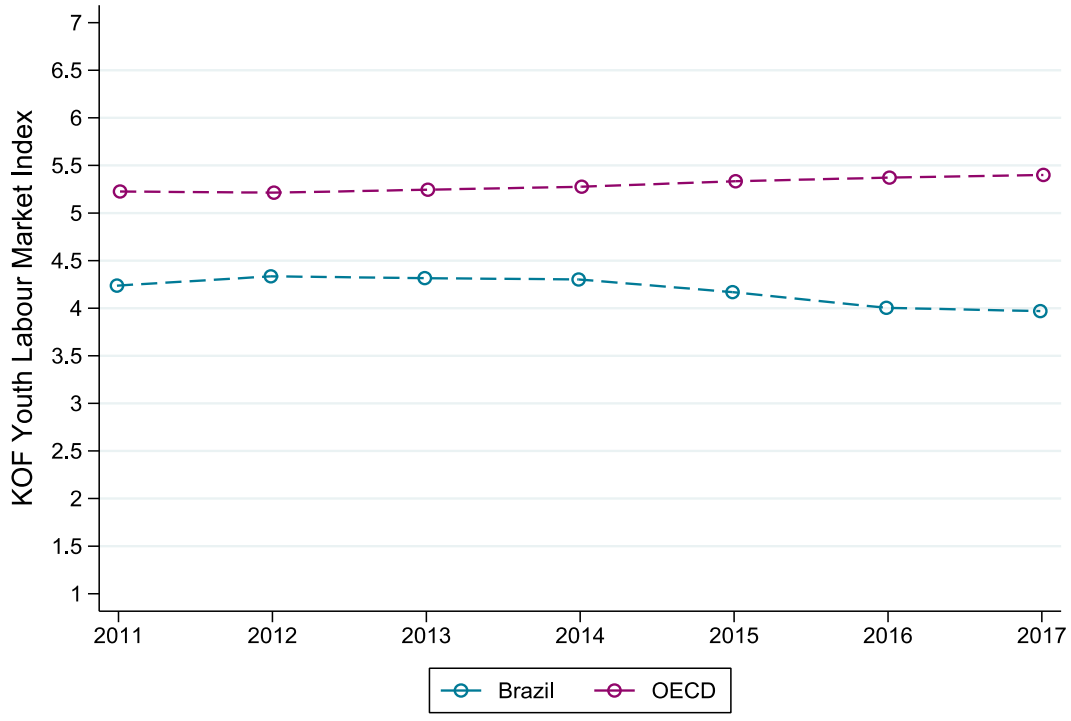
Before aggregating the indicators into a single index, each indicator value is rescaled into an indicator score that takes values between 1 and 7, where higher scores suggest more desirable outcomes. The data for the indicators are collected from different international institutions and cover up to 178 countries from 1991 onward. Unfortunately, data are not available for all countries in every year, so that one of the major limitations of the KOF YLMI is data availability. When data is lacking, a dimension can occasionally be based on a single indicator or must be omitted entirely when not a single indicator for that category has data available. A lack of indicators can make comparisons across countries or groups of countries problematic and sometimes even impossible.

1.2.3 The KOF Youth Labour Market Index for Brazil

Like many countries, Brazil suffers from a lack of data across several indicators of the KOF YLMI. Only four of the twelve indicators were available for 2017. The available indicators used to calculate the KOF YLMI for Brazil are the unemployment rate, the NEET rate, the vulnerable employment rate and the relative unemployment ratio.

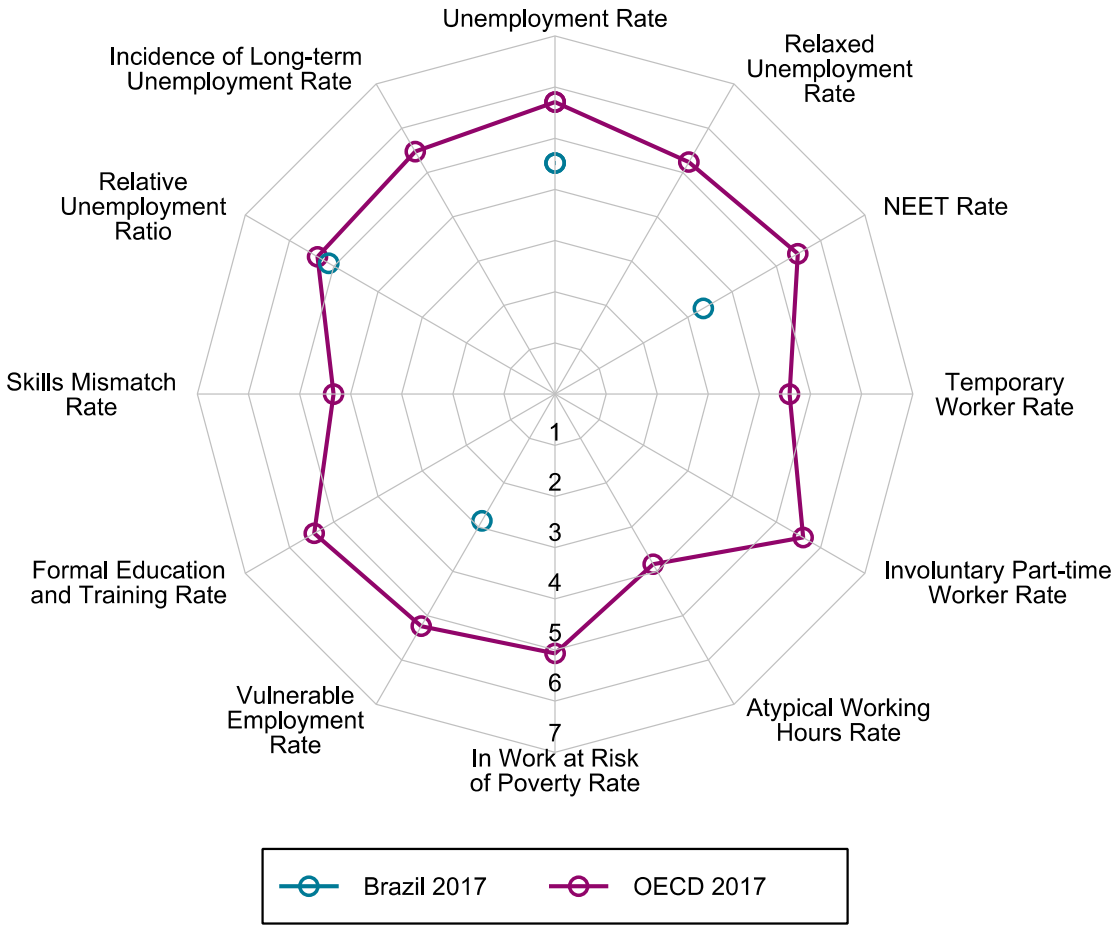
Figure 2 shows the KOF YLMI Spiderweb for Brazil and the OECD in 2017. Brazil's overall index, or average across all indicators, is 4.19, which is below the OECD average of 5.30 for the same year. In terms of individual indicators, Brazil exhibits lower rates and ratios than the OECD in all categories. While Brazil's relative unemployment rate and unemployment rate are rather close to OECD values, Brazil performed significantly worse in terms of the NEET rate and the vulnerable employment rate. Since Brazil's KOF YLMI is calculated from only 4 of the 12 indicators, comparisons with the OECD should be made with caution. Nonetheless, opposing trends.

Figure 3: Youth Labour Market Index: Brazil versus the OECD average, 2011–2017



contrasts the evolution of this reduced KOF YLMI for Brazil with the OECD average over time from 2011 to 2017.

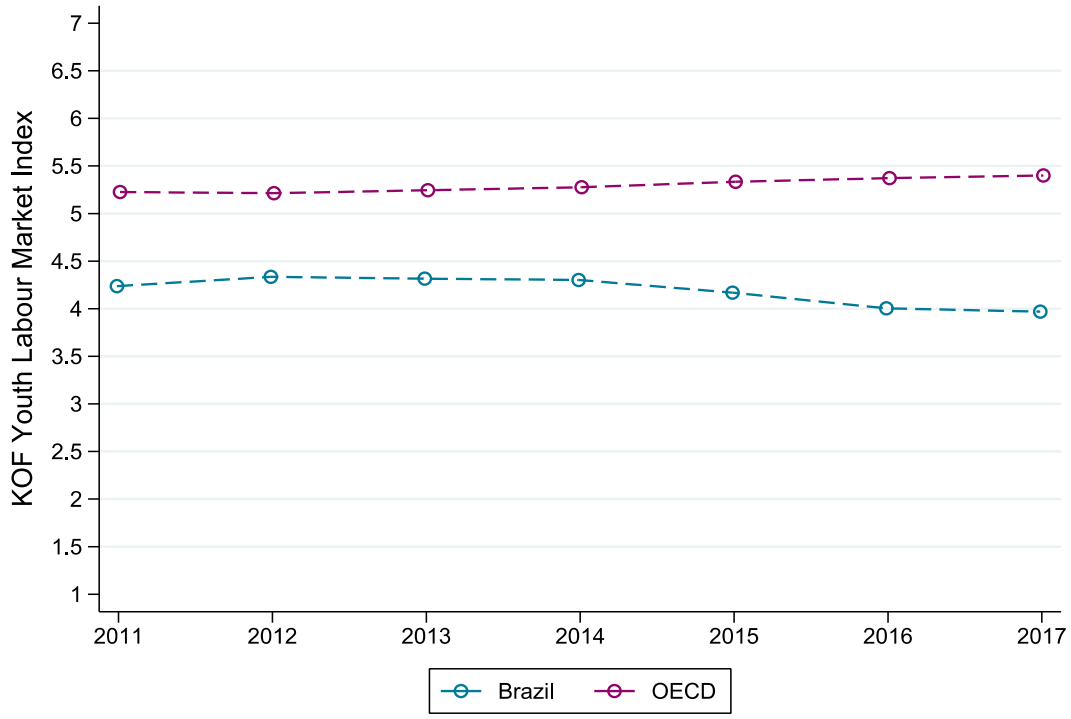
Figure 2: Spiderweb Youth Labour Market Index: Brazil Versus the OECD average, 2017



Source: KOF (2020).

The index value for the OECD average was consistently higher than that for Brazil, implying that the youth labour market situation in OECD countries compares favourably with the market situation faced by Brazil's youth. Although the KOF YLMI for the OECD remains largely constant over the observed period, a slightly positive trend can be identified. In contrast, the KOF YLMI in Brazil has declined slightly over the observed period. Although we must again emphasise the limitations of the KOF YLMI for Brazil due to data availability, the gap has widened significantly over the observed period due to opposing trends.

Figure 3: Youth Labour Market Index: Brazil versus the OECD average, 2011–2017



Source: KOF (2020). Note: index based on common indicators available for the whole period considered.

1.3 Brazil's Political System

Understanding the basics of a country's political system and getting to know the political goals with respect to its education system are crucial points for the understanding of the education system in a broader sense. Therefore, in Section 1.3.1 we start by presenting Brazil's political system in general. Then, in Section 1.3.2, we focus on the politics and goals of the education system.

1.3.1 Overview of the Brazilian Political System

The Federative Republic of Brazil is considered a federal representative democratic republic with a presidential system. The president is both the head of state and the head of government in this political system. The administrative organisation is composed of the federal government, the 26 states, the federal district and the municipalities. The federal government is divided into three independent branches: legislative, executive and judicial. The executive branch contains 21 ministries headed by the president and administered by cabinet ministers appointed and dismissed by the president. The legislative branch contains two chambers—the Federal Senate and the Chamber of Deputies—containing 81 and 513 members, respectively. The judicial branch is based on a civil law adversarial system and is organised in different jurisdictions throughout state and federal governments (World Atlas, 2019).

The Economist Intelligence Unit (EIU) annually publishes a democracy index which cumulates the scores (from 0 to 10) of 60 indicators grouped into five categories to assess a country's level of democracy. In the 2019 edition of this index, Brazil scored 6.86. This ranks Brazil 52nd globally and classifies Brazil's regime type as flawed democracy, which is the second highest categorisation in the index below full democracy. Other flawed democracies in the 2019 EIU ranking include Mexico (rank 73), Poland (rank 57) and Thailand (rank 68). Brazil and the LAC region overall remain the most democratic emerging market region in the world despite being home to some extremely authoritarian regimes like Venezuela (rank 140) and Cuba (rank 143) and some full democracies like Uruguay (rank 15). Brazil can thus be considered averagely democratic for the region, ranking 10 out of the 23 countries. Brazil's score has improved almost linearly since 2006, beginning at 7.38 and reaching 6.86 in 2019. According to the EIU (2019), of the five categories that comprise the index, Brazil has scored extremely well in electoral

process and pluralism (9.58) and civil liberties (8.24) but poorly in political culture (5.00) and functioning of government (5.36).

The Worldwide Governance Indicators of the World Bank are a set of six indicators that evaluate different aspects of governance within a country. The six indicators are voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption. In the 2019 Worldwide Governance Indicators, Brazil performed poorly in comparison with the LAC region, falling below the regional average across all indicators. According to the World Bank (2020d) Brazil performed worst in the political stability and absence of violence indicator (25th percentile) and best in voice and accountability (59th percentile rank).

The Corruption Perception Index (CPI) published by Transparency International ranks 198 countries and territories by their perceived level of public sector corruption. The CPI uses a scale from 0 to 100, with values close to 100 meaning very clean and values close to zero meaning highly corrupt. On the 2019 CPI, Brazil ranked 106th out of the 198 countries: one position lower than in the previous assessment. According to Transparency International (2019), with a score of 35, Brazil ranked well behind other South American nations such as Uruguay (21st) and Chile (26th) but ahead of Bolivia (123th) and Venezuela (173rd).

1.3.2 Politics and Goals of the Education System

The first legal constitution after the abolition of the military regime in 1988 forms the basis for modern Brazilian legislation and therefore also for today's Brazilian education system. In 1996, the legislature passed arguably the most significant constitutional amendment: the so-called Law of National Guidelines for Education (Lei de Diretrizes e Bases da Educação Nacional, LDB). It required a common national basis for the curriculum at the primary and secondary levels, increased the number of instructional days, included a holistic monitoring and evaluation framework and allowed for the integration of vocational education (Stanek, 2013, p. 2).

The 1988 Constitution requires the federal government to allocate at least 18% of its budget on education. States and municipalities have an even higher quota, as they are obliged to spend at least 25% of their budgets on education. The 1996 constitutional amendment introduced level-specific targets (e.g., states and municipalities are required to spend at least 60% of their education budgets on elementary school). This law did not take into account the immense regional financial disparities and the resulting inequity in access and quality of education. As a result, some state schools had 15 times higher spending per student (World Bank, 2012, p. 4). This was addressed in the 1996 LDB, in which the government introduced a system of policies to reduce inequality and disparity in education spending per student, mainly through the creation of the Fund for Maintenance and Development of the Fundamental Education (Fundo para Manutenção e Desenvolvimento do Ensino Fundamental, FUNDEF) from 1996 until 2006 and subsequently through the Fund for Maintenance and Development of Basic Education (Fundo de Manutenção e Desenvolvimento da Educação Básica, FUNDEB). These two education development funds governed education funding allocation and increased funding of education (UNESCO, 2007).

More recently, amendments to the Education Act increased the length of compulsory education from 9 to 14 years to 4 to 17 years and created additional opportunities for vocational training. In 2020, Parliament approved an important constitutional amendment that consolidates and changes the financial structure of the main funding system for public education in Brazil (i.e., FUNDEB). First, the federal government increased its contribution to FUNDEB from 10 to 23%. Second, the financial resources are now passed directly to the poorest municipalities, whereas previously they went to the states, which redistributed the funds internally. The third major change, and the most innovative and forward-thinking of the three, was that national transfers are newly linked to educational outcomes, which the states must gather, monitor and evaluate (World Bank, 2020d).

In Brazil, education is a federal competence, and national education policy is coordinated by the Ministry of Education (Ministério da Educação, MEC). A system of ministries and government offices coordinates

education in Brazil. The MEC is divided in the following six secretariats: Secretariat of Basic Education; Secretariat of Continuing Education, Literacy and Diversity; Secretariat of Distance Education; Secretariat of Special Education; Secretariat of Technical and Vocational Education and Secretariat of Higher Education (MEC, 2020a).

While the MEC is responsible for setting the framework and goals for education, responsibilities for public education in Brazil are complex and partly overlapping. The 1996 LDB states that education is the shared responsibility of the federal, state and municipal governments. While the federal government is mainly responsible for drafting general education policies and providing higher education, state and municipal governments are responsible for locally administrating pre-primary, primary and secondary education (Government of Brazil, 2020).

As previously discussed in Section 1.1, it is worth mentioning that Brazil performs surprisingly well on several education-related indicators of the GII 2020 despite being classified as an upper-middle-income country. In this context, it is worth reiterating that WIPO (2020) recognises Brazil's strengths in human capital and research, particularly in education spending (12th), gross R&D spending (30th), global R&D firms (23rd) and university quality (28th).

2. Formal System of Education

2.1 Formal System of Education

Brazil's formal education system is divided into basic education (educação básica) and higher education (educação superior). Basic education consists of five distinct, sequential levels including nursery (ages zero to three), kindergarten (ages four and five), primary (ages six to ten), lower secondary (ages 11–14) and upper secondary (ages 15–17). In the following, this factbook refers to nursery and pre-primary school as early childhood education and care, primary and lower secondary as elementary school (ensino fundamental) and upper secondary as high school (ensino médio).

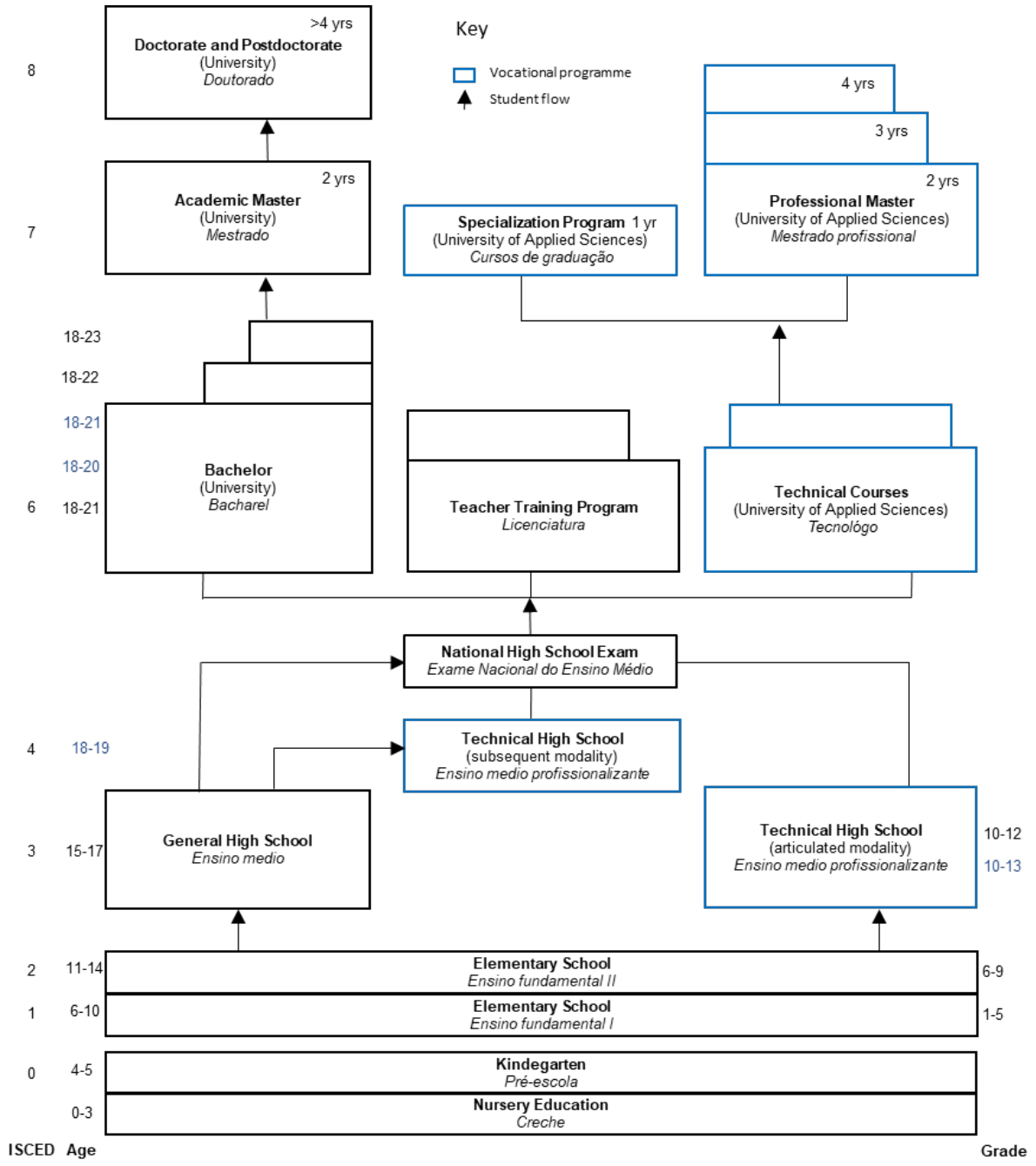
Higher education consists of undergraduate and graduate programs. Undergraduate degrees include bachelor university programs with a duration of between four and six years (bacharel), pedagogical teacher programs of four years (licenciatura) and technical courses at a university of applied sciences of between two and three years (tecnólogo). Graduate programs include academic and research-oriented programs such as master's programs of two to four years (mestrado), doctoral programs of four years (doutorado) and postdoctoral programs (pós-doutorado) as well as professionally and labour market-oriented specialised programs of one year (cursos de graduação) and professional education and training (PET) master's programs of two to four years. Although reality deviates significantly from these theoretical age cohorts, the starting age for undergraduate students is 18 and for graduate students is 22.

Until 2009, compulsory school consisted of elementary school for children aged 7 to 14, corresponding to primary and lower secondary education. With a 2006 constitutional amendment, the mandatory school entry age was lowered to six years. In 2010, obligatory education was extended to upper secondary education for students between 15 and 17 years of age. In 2013, the government again amended educational requirements and extended public education to kindergarten for children of four and five years. By the end of 2015, all those amendments were fully installed, making education compulsory for all children between 4 and 17 years of age. This basic compulsory education cycle includes preschool, primary and secondary education. All levels of compulsory education are provided free of charge at public institutions (Almeida et al., 2016).

The main language used in Brazilian education is the national language Brazilian Portuguese. However, some public schools use co-official languages, including indigenous Indian or European languages

(Monroy et al., 2019). In 2020, 47.3 million enrolments were registered in the 179,500 basic education schools in Brazil (INEP, 2020b, p. 6). An illustration of the Brazilian education system with its different educational pathways compared to the International Standard Classification of Education (ISCED) is provided in Figure 4.

Figure 4: The Brazilian Education System



Source: own illustration based on the OCED (2015, p. 17).

To get a clear understanding of enrolment by education level, **Fehler! Verweisquelle konnte nicht gefunden werden.** shows both the net enrolment rate (NER) and gross enrolment rate (GER) by education level. The NER quantifies the total number of students in the theoretical age group for a given education level enrolled at that level expressed as a percentage of the total population of that age group. The GER quantifies the number of students enrolled at a given education level—irrespective of their age—as a percentage of the official school-age population corresponding to the same level of education. For example, for the primary education level, the NER indicates how many students between 6 and 10

years of age are actually enrolled in primary school, while the GER sets the actual number of students in primary education in relation to those who are in the official age range to attend primary education.[10]

Table 6: Net Enrolment Rate and Gross Enrolment Rate, 2011

Education Level	ISCED 2011	Net Enrolment Rate (%)	Gross Enrolment Rate (%)
Early childhood	0	N/A	54
Primary	1	95	132.5
Secondary	2–3	78	95.5
Lower secondary	2	97	100
Upper secondary	3	85	89
Postsecondary non-tertiary	4	N/A	N/A
Tertiary	5–8	N/A	43.5

Source: UNESCO Institute for Statistics

Since great insights can be derived from the comparison between NER and GER, Table 6 shows the latest available data for both indicators. Unfortunately, the latest GER data available for Brazil is from 2011, while NER data is available on an annual basis. This section therefore compares the two enrolment rates from a decade ago, knowing that the education system has undergone serious changes that are likely to have a drastic impact on current enrolment rates.

The data from the UNESCO Institute for Statistics shows that only 54% of all children younger than six years old attend pre-primary education programs. Disaggregating the data reveals that the main reason for the low pre-primary enrolment rate is the very low participation of zero to three year olds in nursery school education, which is only 23% in Brazil and substantially higher in OECD countries at 36%. For children aged four and five, the kindergarten enrolment rate is significantly similar at 84% in Brazil compared to 87% in OECD countries (OECD, 2019a, p. 6). The most recent school census shows that preschool enrolment rates increased by 8.4% from 2016 to 2019 but decreased by 1.6% from 2019 to 2020. According to INEP (2020b, p. 6), this reduction was mainly caused by enrolments in the private network, which fell by 7.1% last year (6.9% in nursery and 7.2% in kindergarten), while the public network grew by 0.5% (0.5% decrease in nursery offset by the 1.2% increase in kindergarten).

Primary school enrolment in 2011 was largely universal in Brazil, with 95% of children between the ages of 6 and 10 attending elementary school. Primary school enrolment is highly disproportionate to the respective age cohort with a GER of 132.5%. The large discrepancy between NER and GER at the primary level implies a significant degree of over-age or under-age enrolment, meaning that a large percentage of the pupils at the primary level are either younger than six or older than 10. The next paragraph explains how this might be linked to the country's high repetition rates. Although both levels of secondary education are compulsory, we observed a clear trend in the data that both NER and GER decrease from lower to upper secondary education. After the end of compulsory education, enrolment drops significantly with a GER of 43.5% for tertiary education.

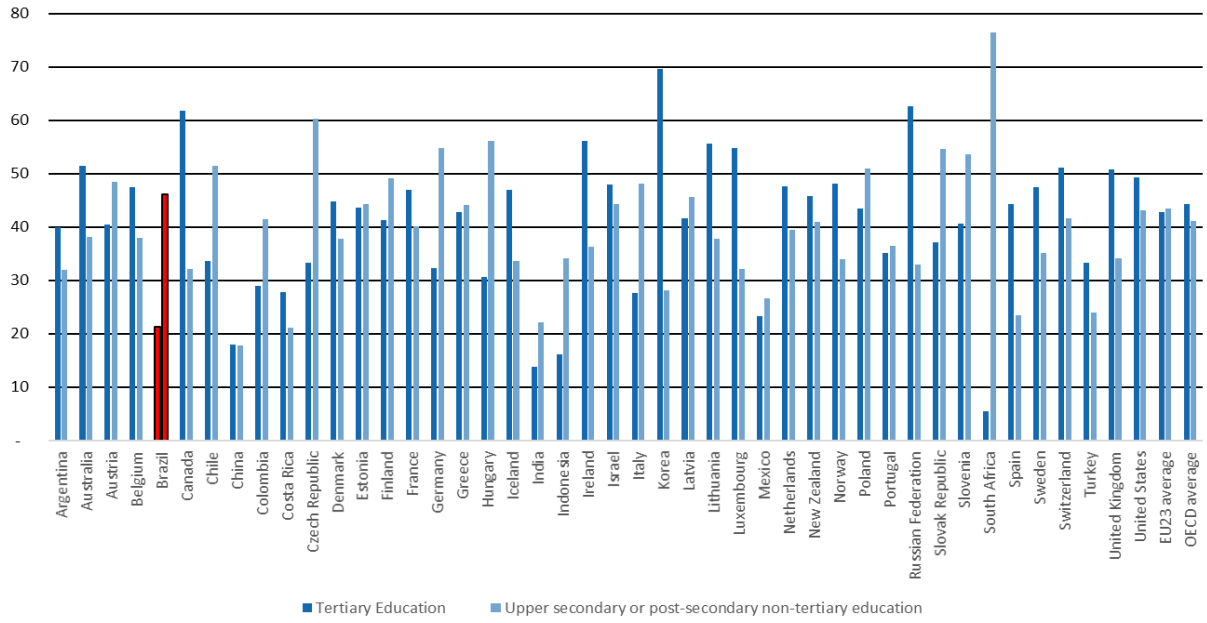
The comparison of NER and GER scores shows that the Brazilian education system has a drastic age–grade distortion, meaning the target age for each level of education does not reflect the actual age of the student cohort. As shown in a 2014 OECD report, 20.9% of elementary school students were overage, while in high school the age–grade distortion was even higher at 28.2% (OECD, 2014). A major

[10] A gross enrollment rate of 100 corresponds to a situation where each child in a given country is enrolled in the corresponding education level. A value above 100 could occur due to students who are older than the typical enrolment age for primary education (e.g. have to repeat grade, adult learners). A value below 100 implies that not everyone who is in the typical age for primary education is actually enrolled.

contributing factor for this age–grade distortion is the high repetition rates exhibited by the Brazilian education system. According to the 2018 Programme for International Student Assessment (PISA) report, Brazil is among the countries with the highest retention rates, ranking 4th out of the 75 examined countries. In 2018, 34.1% of the students had repeated a grade during primary and secondary school. Furthermore, Brazil has some of the highest discrepancies in grade repetition probability between advantaged and disadvantaged groups as well as between public and private schools (OECD, 2019). Brazil also exhibits an alarmingly high dropout rate, which also contributed in part to high levels of age–grade distortion of 2% for elementary school and 8.1% for high school in 2013 (INEP, 2019).

Such structurally high repetition and dropout levels indicate that many Brazilian students leave school before completing high school and often even before completing elementary school (Almeida et al., 2016, p. 11). As Figure 5 shows, only approximately 67% of Brazilians aged 25 to 34 had attained at least an upper secondary qualification in 2018, while in OECD countries this percentage was 85% (OECD, 2019). Similarly, only 21% of the population aged 25 to 34 had completed higher education in Brazil compared with 37% in Chile, 29% in Colombia and 44% in the average OECD country (OECD, 2019).

Figure 5: Percentage of 25- to 34-year-olds That Have Attained Either Upper Secondary, Post-secondary Non-Tertiary or Tertiary Education in OECD Countries, 2018



Source: own figure based on the OECD (2019).

In the modern labour market, upper secondary attainment has become the minimum requirement. Young people who leave school before graduating not only have great difficulty finding a job but are also twice as likely to have low numeracy skills as those with an upper secondary education (OECD, 2019, p. 40). Participation rates in upper secondary and tertiary education are still held back by social inequalities and regional disparities, so the proportion of the Brazilian population with an upper secondary and tertiary degree remains low by regional standards despite the rapid expansion (Monroy et al., 2019).

2.2 Pre-Primary Education

With the approval of the 1996 LDB, early childhood education for children aged zero to six became a constitutional right. The law recognised childhood education as an integral part of the education system, and policy development should be coordinated under the leadership of the education sector (UNESCO, 2007). The law gives states and municipalities full responsibility for the provision of pre-primary education within their jurisdictions, including funding, administration and operation (OECD, 2015, p. 14). Since

the states and municipalities are mandated with the responsibility to provide early childhood education, they can either establish and manage an independent local program or opt to follow the state system. Early childhood education is financed at the municipal level with funds from FUNDEB (UNESCO, 2007, p. 15). States are not involved in the provision of early childhood services but are responsible for regulating and supervising whatever early childhood services exist where municipalities have not established their own systems. States are also responsible for offering training programmes for early childhood teachers.

Pre-primary education is divided into a three-year cycle (nursery) and a two-year cycle (kindergarten). Nursery education for children aged zero to three is usually offered on a full-day basis, and enrolment is voluntary. Kindergarten programmes for children aged four and five are offered in half-day classes, attendance of which is compulsory (UNESCO, 2007, p. 15).

Participation in pre-primary education has been low in Brazil until recently, especially among low-income households. With the introduction of compulsory kindergarten and significant investments in infrastructure and human resources, the absolute number of preschool-age children has almost doubled from 4.6 million in 1999 to 9.0 million in 2019 (INEP, 2020d). Although the nursery school enrolment rate has increased substantially in recent years from 10% in 2012 to 23% in 2017, it remains far below the OECD average of 36%. Although it is compulsory, kindergarten attendance is still not universal. The participation rate has increased significantly from 60% in 2012 to 84% in 2017, which is a relatively high percentage even by OECD standards, where 87% of the relevant age cohorts are currently enrolled in kindergarten (OECD, 2020). The large discrepancy between nursery and kindergarten enrolment rates stems primarily from the fact that kindergarten attendance is compulsory while nursery education is not.

Provision of pre-primary education in Brazil is predominantly public, with 72% of children enrolled in public institutions in 2017 compared to 66% on average across OECD countries (OECD, 2019, p. 8). The vast majority of the public institutions are managed by municipal governments, while state and federal governments play a negligible role in the provision of pre-primary school, with 0.68% of children enrolled in such institutions (INEP, 2020d).

Pedagogical guidelines for pre-primary education are defined at the national level and supplemented by the respective states and municipalities. The pedagogical goals of preschool education programs include three main themes: promoting optimal socio-emotional personality development, fostering a natural learning process and ensuring a respectful and cooperative form of communication (UNESCO, 2007). Pre-primary education guidelines and curricula take into account the developmental stage of the child and the cultural and social diversity of the target population.

2.3 Primary and Lower Secondary Education

A distinctive feature of the Brazilian education system is that primary and lower secondary education are combined in elementary school, which begins at age six and lasts nine years. The beginning and duration of primary education has undergone a significant change since before 2010 it was compulsory from the age of seven and lasted only eight years (see Section 2.1 for more detailed information).

Elementary education is divided into a five-year cycle (ensino fundamental I) and a four-year cycle (ensino fundamental II). Elementary education is provided free of charge in public institutions but not in private institutions. In this context, it is worth mentioning that the quality of elementary school varies greatly depending on the institution (Stanek, 2013, p. 3). A major factor that determines the quality of an elementary school is the hours of instruction per year, which differ significantly between private and public institutions. While public schools are required by law to teach at least 800 hours per school year, private institutions often expand this to 1,000 or more hours of instruction (Monroy et al., 2019).

It is the responsibility of state and local governments to fund primary and secondary education in their jurisdictions. Public education is free, and schools receive funding based on enrolment rates. States and municipalities are required to set aside 25% of their tax revenues for education, primarily for elementary

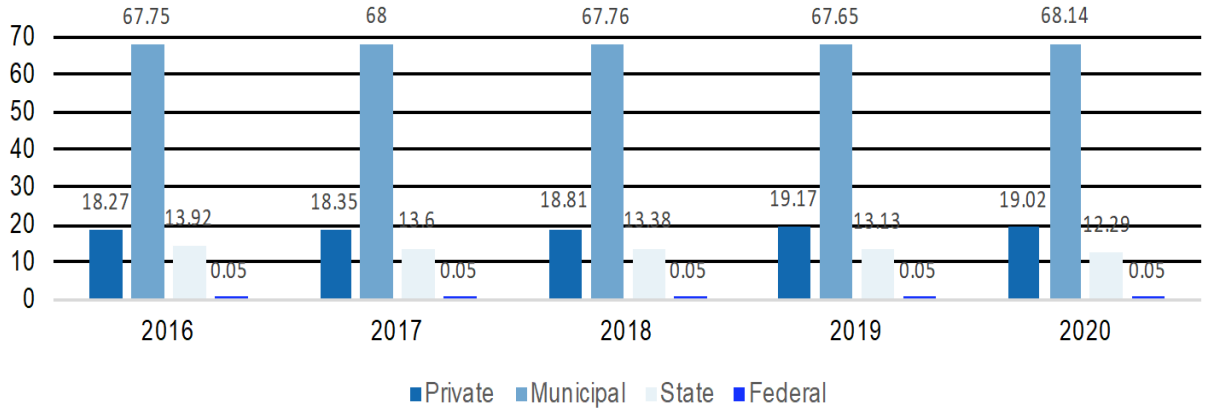
school (OECD, 2015, p. 15). At the primary level, Brazilian spending per pupil in 2012 (US$3,095) was only 38% of the OECD average (OECD, 2015, p. 15).

The primary objectives of elementary school are the development of reading, writing and arithmetic. In addition, according to Article 26 of the LDB, students should acquire knowledge about the physical and natural world and the realities of society and politics and develop critical thinking capabilities. The basic curriculum for the first five years of elementary school (ensino fundamental I) includes mathematics, Portuguese, natural sciences, arts, history, geography and physical education. Furthermore, the LDB requires schools to offer elective religious education. Beginning in the sixth grade of elementary school (ensino fundamental II), English instruction is part of the curriculum, whereas prior to the 2016 amendment, states could decide independently whether and which foreign language to teach (Government of Brazil, 2020). The development of the curriculum is regulated in that the National Common Base includes three quarters of the instruction defined along the above themes, while the remaining 25% is based on the local and regional socioeconomic conditions of each school (IBE UNESCO, 2007).

In the Brazilian education system, student performance is measured on a grading scale of 0 to 10, with five clusters ranging from 0.0 to 2.9 (deficient), 3.0 to 4.9 (insufficient), 5.0 to 6.9 (average), 7.0 to 8.9 (good) and 9.0 to 10.0 (excellent). Under the state system, promotion of all students to the next grade is determined by annual testing at the end of each school year. Since it is far from unusual to hold a child back (see Section 2.1), the age cohorts become quite mixed. Upon completion of elementary school, students receive a certification of completion without final graduation examinations (Monroy et al., 2019).

The 2020 School Census registered 26.7 million elementary school enrolments, which is 3.5% lower than for 2016 (INEP, 2020e, p. 23). The disaggregated enrolment rates for elementary education indicate that attendance is largely universal in both cycles, with 96% for children aged 6 to 10 and 97% for children aged 10 to 14 (UNESCO-UIS, 2020). Enrolments by educational providers during both cycles (initial and ultimate year) provide interesting insights. Concretely, Figure 6 shows that in the initial years of elementary school, the municipal network has the largest share (68.1% of enrolments) followed by private (19.0%) and state (12.3%) networks. Federal schools enrol a small and stable share of approximately 0.5%. The percentage of municipal network registrations remained relatively stable in the observed period. During the sample period, state network enrolment decreased by 1.1% while enrolment in private schools increased by 2.1%.

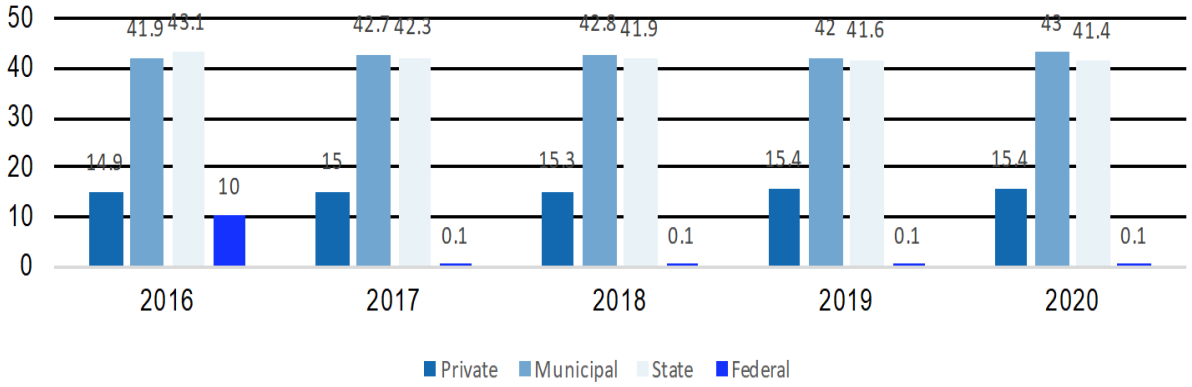
Figure 6: Enrolments in the Initial Elementary School Year, 2016–2020



Source: own figure with numbers from Instituto Nacional de Estudos e Pesquisas (INEP) (2020b).

In contrast, Figure 7 shows that in the ultimate year of primary education, the municipal network had the greatest participation at 43.0% of enrolments followed by the state (41.4%) and private (15.4%) networks. Between 2016 and 2020, municipal network enrolment increased by 1.1% while the number of state network enrolments decreased by 1.7%. In the private network, there was a 0.7% increase in enrolments from 2016 to 2020.

Figure 7: Enrolments in the Ultimate Elementary School Year, 2016–2020



Source: own figure with numbers from INEP (2020b).

Overall, it is noteworthy that in the early years of elementary school, the municipal network is the dominant education provider, accounting for more than two thirds of all enrolments. This picture changes in the final years of primary school, where both municipal and state schools account for approximately two fifths of all enrolments (INEP, 2020b, p. 23).

2.4 Upper Secondary Education

Upon completion of elementary school, students can enter (upper) secondary education without further examinations. The theoretical entry age for high school is 15. General academic high school programmes have a duration of three years while some vocational programmes can last up to four years (see Section 3.1 for more information). According to IEM Spotlight (2013, p. 4), high school education is offered at general academic institutions (instituições de ensino médio) and technical schools (instituições de ensino técnico).

Upper secondary education is part of basic education, and its completion has been compulsory for the 15 to 17 age cohort since 2013. Public schools offer free high school education. Similar to the elementary school level, private schools tend to provide students with a better quality of education but play a minor role in the allocation of students: 86% were enrolled in public upper secondary institutions in 2017 (INEP, 2020d).

The general upper secondary curriculum focuses on the same subjects taught in elementary school. Students are also taught philosophy, sociology and an additional optional foreign language (Government of Brazil, 2020). As a measure to address high dropout rates, Brazil implemented an education reform in 2016 which gradually increased the number of compulsory hours of instruction from the previous 800 hours per year (the same level as in elementary school) to 1,400 in 2022 (Monroy et al., 2019).

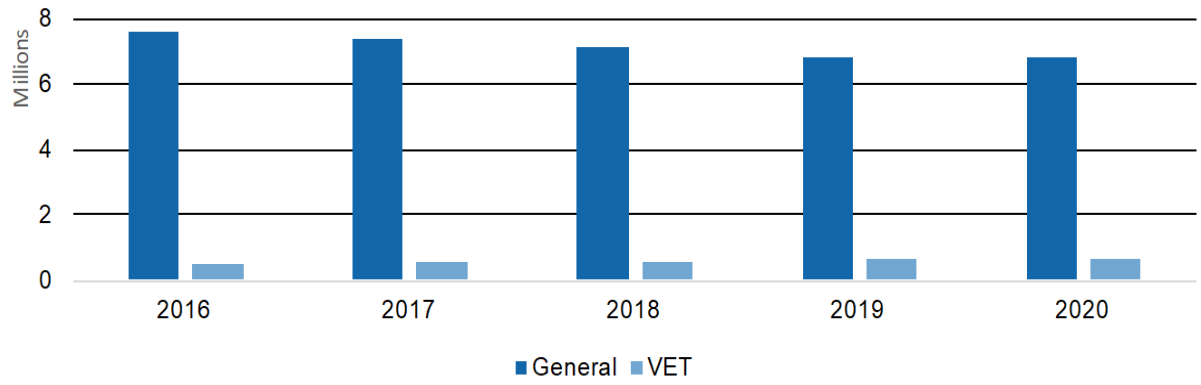
Vocational training at the upper secondary level, which also requires completion of elementary school, can last two to four years and culminates in a degree that provides access to higher education. These programs typically combine a reduced core curriculum with training in vocational subjects. Typically, these technical and vocational programs take three or four years to complete, but the duration can be shortened for individuals who have already completed or begun general secondary education (Monroy et al., 2019).

Upon graduation, students not pursuing higher education receive a certificate of completion of upper secondary education without sitting for a final examination. Students seeking higher education must attend an examination testing their knowledge in courses taken in high school (see Section 2.5 for more information). Students who drop out of school early have the opportunity to earn a secondary school diploma by taking an equivalency examination called the National Exam for Certification of Youth and Adult Skills (Ministery of Education, 2020).

Despite increasing rates of upper secondary enrolment and constitutional obligation, Brazil still has one of the highest proportions of adults without upper secondary education among OECD countries. 32.5% of 25- to 34-year-olds had not completed upper secondary education in 2018, which is more than double the OECD average of 15.0% (OECD, 2019). Similarly, the 2018 Census indicates that 24.6% of 18- to 24-year-olds are not attending and have not completed upper secondary school, 9.2% of the same age cohort are still attending high school and 1.8% are attending elementary school (INEP, 2019). Despite the steady increase in participation in vocational and technical programs over the past decade, the percentage of students enrolled in a secondary vocational and technical program is still relatively low at 24.7% of all secondary students in 2018 (INEP, 2020d).

Figure 8 shows the number of high school enrolments from 2016 to 2020 for both the general and VET programs. In 2020, Brazil registered 7.6 million high school enrolments. Total registrations rose slightly (1.1% last year), thus interrupting the downward trend observed in recent years (a decrease of 8.2% from 2016 to 2019). Enrolment in vocational education has grown by 29.5% in the last five years from 530,000 in 2016 to 690,000 in 2020 (INEP, 2020e, p. 26).

Figure 8: Number of High School Enrolments, 2016–2020



Source: own figure with numbers from INEP (2020b).

The state network has the largest share of secondary school enrolment at 84.1% followed by the private network with 12.3%. The percentage of state and private network registrations has remained relatively stable in recent years (INEP, 2020e, p. 26).

2.5 Postsecondary and Higher Education

Upon completion of upper secondary education, students exit compulsory basic education and enter higher education, which is the responsibility of the federal government. Higher education is organised into undergraduate and postgraduate programs. Undergraduate programs last between four and six years, while postgraduate programs last two years for master's programs and four years for doctoral programs. The theoretical entry age for undergraduate students is 18 years and for postgraduate students, 22 years. Undergraduate education can be broadly divided into three streams: the general academic bachelor program (bacharel), the pedagogical teacher training program (licenciatura) and the higher technical education program (tecnólogo).

The standard duration of an academic bachelor's degree ranges from four years (e.g., business, computer science) to six years (e.g., medicine). These programs include a minor part of general education, a thesis, a mandatory internship and, in some subjects, a final examination (e.g., law, medicine). After graduation, students can continue their studies with specialisation and master's degrees and, in some cases, doctoral studies. The pedagogical teacher program trains future teachers from pre-primary to upper secondary school levels. This program lasts three to four years and includes a practical teaching internship. It is possible for students in another field to complete a one-year program that qualifies them to become teachers. Higher technical education programs (also called technical courses) can last be-

tween two and three years. These programs include practical knowledge, usually geared toward a professional job, and some courses therefore require a mandatory internship. The distinctive feature of this higher technical education is that graduates gain access to professional master's degree programs at the graduate level. By far the most popular degree program is business (Kauer, 2015).

According to the 2018 INEP statistics, approximately 68% of undergraduate students were enrolled in bachelor programs, 19% in teacher programs and 13% in professional and technical higher education programs (2019). According to the 2018 Census of Higher Education, 21.7% of 18- to 24-year-olds attended tertiary education, while 9.2% were still in high school (INEP, 2019). Young women (25- to 34-year-olds) in Brazil are 42% more likely than men to have a tertiary education degree (OECD, 2019a, p. 1). Those who obtain a tertiary education degree in Brazil typically complete a bachelor's degree program, and very few go on to complete a master's or doctoral degree, although bachelor's degrees in Brazil tend to be longer than their equivalents in Europe or North America (OECD, 2019a, p. 2).

Upon completion of upper secondary school, students interested in entering tertiary education are required to sit further examinations. Traditionally, high school students take the so-called Vestibular, an examination testing the knowledge of subjects taught in high school as well as the candidate's writing ability. The traditional Vestibular takes into account the candidate's placement rank and is specific to each higher education institution (HEI) application. For some more competitive HEIs, the Vestibular may last up to four consecutive days (D'Andrea et al., 2015).

In recent years, a new national baccalaureate examination has emerged which is organised by the MEC. The so-called National High School Exam (Exame Nacional do Ensino Médio, ENEM) covers the high school curriculum as well as objective questions and an essay. Some colleges and universities also include interviews, courses, transcripts or experience and job performance as part of the selection process. The ENEM has emerged as a national and more holistic measure of student achievement and has been modified to include 180 questions and a written component presented over two consecutive days. In 2018, approximately 4.1 million students took the ENEM, which is primarily used for admission to HEIs and eligibility for government scholarships (INEP, 2019). Since 2009, admission to all public universities is based on the ENEM, whereas previously many of the leading public universities had their own entrance examinations. Most private institutions adapted to this change and also began using the ENEM as the main admission criterion. Admission is highly competitive, with more than 1.1 million applicants to public universities competing for roughly 55,000 available seats in 2015, with an even higher ratio of applicants per seat at top institutions (OECD, 2018).

Similar to previous levels of education, undergraduate education at public institutions is free, while private colleges can charge large fees ranging from US$1,880 to US$9,690 per year *(Times Higher Education*, 2019). However, in terms of service delivery and educational quality, a paradigm shift is occurring in the institutional landscape of higher education. While private institutions used to be the clear leaders in terms of the quality and quantity of services delivered to students of the basic education level, this is no longer true for HEIs. Public institutions consistently rank first in terms of quality in both the MEC's General Index of Courses (2020) and international university rankings, where the best Brazilian institutions are all public (e.g., the *Times Higher Education* World University Rankings and the QS World University Rankings). A major factor contributing to the differences in quality between public and private universities is that private institutions are for profit and therefore tend to cut costs. As a result, they rarely offer degree programs with high operating costs that require laboratories or highly paid professors, and faculty at public universities are more than three times as likely to hold doctoral degrees as faculty at private universities (59% vs. 18%; OECD, 2018, p. 80).

2.6 Postgraduate Education

Within the level of postgraduate studies, the Brazilian system distinguishes between further education and specialisation programs (lato sensu) and academic and professional master's and academic doctoral programs (stricto sensu). Specialisation studies are career-oriented degrees that are additional

qualifications that help students prepare for the labour market. Access to postgraduate specialisation programs is independent of admission criteria to higher academic institutions but requires completion of an undergraduate degree (OECD, 2019).

There are two types of master's programs: one with a clear academic focus and one with a more applied program. On the one hand, the academic research degree (mestrado) requires completion of a bachelor's degree or a teaching degree, entrance examinations and foreign language tests. Most of these academic research degrees last two years and conclude with a thesis defence and comprehensive examinations. On the other hand, the professional master's degree (mestrado profissional) has a more applied and professional focus and is usually considered equivalent to a standard master's degree, although graduates cannot enter doctoral programs (Kauer, 2015). Only 0.8% of 25- to 64-year-olds in Brazil hold a master's degree, which is well below the OECD average of 13% (OECD, 2019, p. 2).

Admission to doctoral studies (doutorado) is traditionally based on the grades of a completed master's degree and qualifications in two foreign languages. In exceptional cases, however, doctoral studies can be accessed following a bachelor's degree, in which case the duration of doctoral studies is extended (e.g., fast-track PhD programs). The duration of a doctoral degree can range from two to four years and is concluded with the defence of the dissertation. Despite the rapid growth in the number of PhDs, which almost doubled between 2009 and 2017 (+93%), only 0.2% of Brazilians earned a PhD in 2017, which is well below the OECD average of 1.1%. In the same year, a staggering 54% of all PhD graduates in Brazil were women compared to 47% across OECD countries (OECD, 2019, p. 2).

3. The System of Vocational and Professional Education and Training

This section of the factbook describes the VET system at the upper secondary level and the PET system at the tertiary level in more detail. Thereby, the term vocational and professional education and training (VPET) refers to both the VET and the PET systems. VPET enrolment has increased significantly in recent years, with an increase of 4.1% compared to 2016, reaching 1.9 million students in 2020 (INEP, 2020e, p. 30).

As briefly discussed in the previous chapter, the Brazilian educational system includes VPET options at several levels, making the different training modalities more flexible. In the Brazilian Constitution, VPET is referred to as professional education (educação profissional). The current structure provides three levels of professional education with distinctive admission criteria, curricula, degrees and consecutive programs: (a) initial and continuing training of workers or vocational training as a part of non-formal education, (b) technical education at the secondary level which is organised independently from general secondary education and is either offered sequentially or concurrently and (c) technical education at the tertiary and postgraduate levels (Brazil, 2010, p. 34).

At the basic level, vocational and technical schools offer employment-oriented short-term training courses without formal admission criteria in terms of age or previous education, which are known as Initial and Continuing Education (Formação Inicial e Continuada, FIC) courses. These programs aim to (re-)integrate young people and skilled workers into the labour market and the continuous development of skills for a productive life. As such, they are primarily aimed at people with low educational qualifications and little or no prior practical experience. The FIC programmes include vocational training courses,

further education and continuing vocational training for workers (MEC, 2021). According to the MEC, such programmes are free of charge, and admission to enrolment primarily depends on the capability to benefit from the training, not on previous schooling or age. The FIC programmes vary in length, ranging from a few months to three years, and are offered by public institutions, associations, entrepreneurs, trade unions and NGOs (Kauer, 2015, p. 45). The curriculum is strictly focused on practical application of a specific occupation and therefore includes little to no general education. FIC programmes do not have a set workload and may have different characteristics in terms of preparation for professional practice of some basic occupations. Typical occupations after a FIC programme are hairdresser, butcher, receptionist and comparable occupations that require relatively little training (Portela Souza, et al., 2015). Graduates of FIC programmes receive a professional qualification certificate (qualificação profissional), which allows access to employment and, in some specific cases, to upper secondary technical education (Monroy et al., 2019).

Overall, the Brazilian VET system is organised across all levels of education from lower-end FIC courses to technical courses and technological programmes. At the lower end of the "quality scale", FIC provides job-specific training opportunities without any school-based component. Such training is mostly informal without external quality control and a low level of organisation. At the upper end of the spectrum, the Brazilian VET system provides highly organised technical training programs with occupation-specific components, mandatory and guided professional experiences and a school-based general education aspect.

3.1 Vocational Education and Training (Upper Secondary Education Level)

Students who are pursuing or have completed general lower secondary education can enrol in technical education courses at the upper secondary level. General education is aimed at preparing students to pursue higher education through entrance examinations. In contrast, the combination of vocational training and general education provided by technical education courses is aimed at preparing students to acquire professional skills and competencies to enter the labour market (Queiroz et al., 2008, p. 4).

Current law further divides technical education at the upper secondary vocational education level into an articulated modality with high school and a subsequent modality for individuals who have already finished high school (as shown in

Figure 10 shows VET enrolments in Brazil from 2016 to 2020 according to the School Census. This is the broadest available dataset but includes only institutions that offer basic education and thus does not encompass all educational institutions that provide technical courses on the secondary level (see Section 3.3.2 for more detailed information on VET providers). The total number of vocational education enrolments has grown by 4.3% between 2016 and 2020.

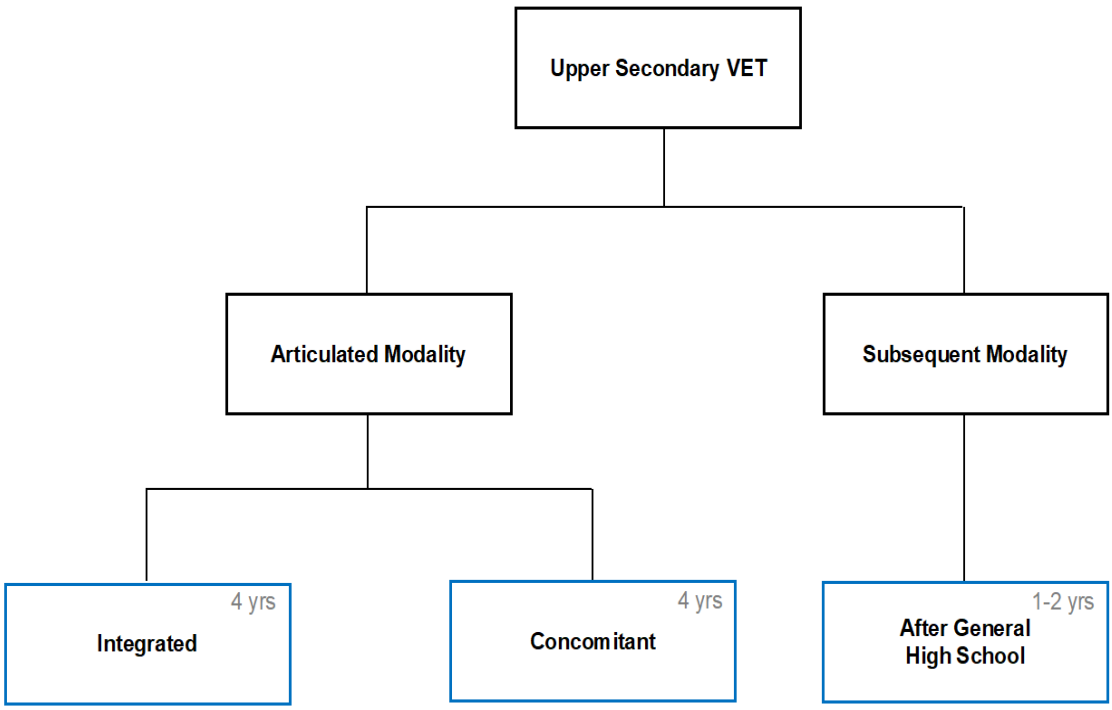
Figure 9). The articulated modality with high school can further be subdivided into integrated or concomitant. Integrated courses include general upper secondary education and technical education courses under a single curriculum and at the same school. Concomitant courses are technical courses that take place simultaneously with the general upper secondary education, but under two separate curricula. This can either be done at one or at two different schools. Subsequent courses are technical courses that require the completion of general upper secondary education for attendance. The subsequent modality takes place at a single school under a single vocational education curriculum (Brazil, 2010, p. 31).

Technical schools (ensino técnico) offer vocational education at the upper secondary level and are organised independently from high schools, although some technical schools offer high school and vocational education in an integrated modality. In this regard, it is worth mentioning that upper secondary

vocational education is not considered part of basic education, while high school is (Brazil, 2010, p. 29). Admission to technical schools also requires an elementary school diploma (certificado de conclusão do ensino fundamental).

Figure 10 shows VET enrolments in Brazil from 2016 to 2020 according to the School Census. This is the broadest available dataset but includes only institutions that offer basic education and thus does not encompass all educational institutions that provide technical courses on the secondary level (see Section 3.3.2 for more detailed information on VET providers). The total number of vocational education enrolments has grown by 4.3% between 2016 and 2020.

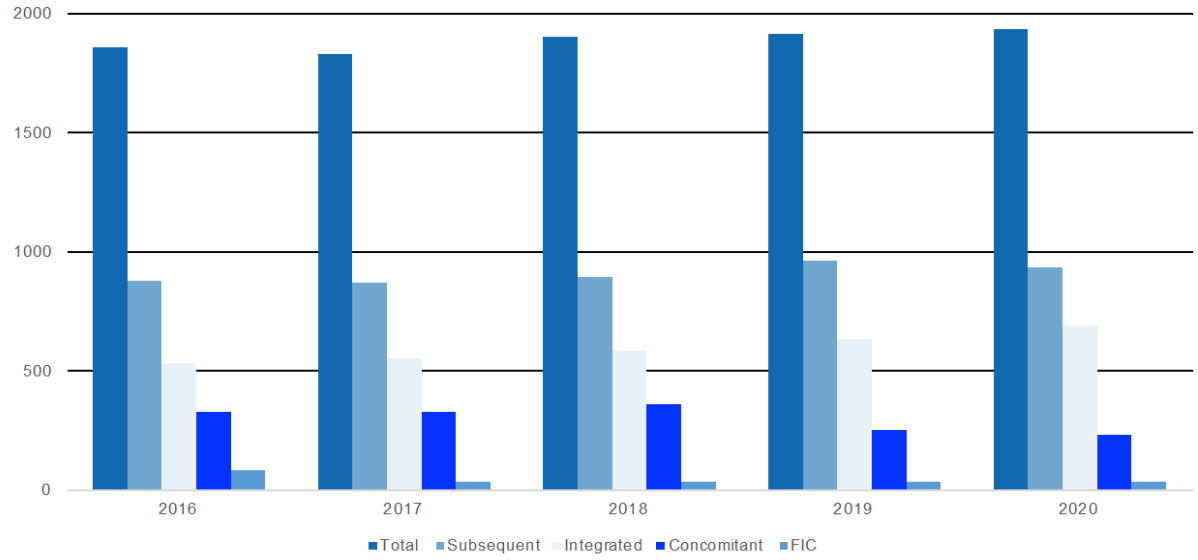
Figure 9: Secondary Level Vocational Education and Training Modalities in Brazil



Source: own figure.

With the completion of upper secondary vocational education, students receive a diploma (diploma de técnico de nível médio) that allows access to all universities, for which they must also take the higher education entrance examination, as must students from regular high schools (Brazil, 2010, p. 29). In the 2020 National Catalogue of Technical Courses (Catálogo Nacional de Cursos Técnico, CNCT), the MEC lists 220 different programs in 13 technological areas, including communications technology, natural resources, industrial technology, health-related fields, tourism and hospitality and military (MEC, 2021).

Figure 10: Vocational Education and Training Enrolments (in Thousands) in Brazil from 2016 to 2020



Source: own figure based on INEP (2020b).

Technical schools typically combine a reduced general core curriculum[11] supplemented with specific training in vocational subjects. While general secondary education lasts three years, technical secondary education generally lasts four years depending on the vocational certification considered. More specifically, the MEC (2016) defines a minimum requirement of 2,200 hours of schoolwork for general upper secondary education. For most technical branches of secondary education, however, a curriculum must include a minimum course load of 2,900 hours, out of which 900 to 1,200 hours are required to be vocational courses. In addition to courses and subjects, technical programs also include a mandatory supervised internship (IBE UNESCO, 2006). Vocational schools establish partnerships with business, which in turn create opportunities for students to develop practical professional skills in the workplace as a part of their training. In turn, the schools offer refresher courses and further education to employees of these businesses (Monroy et al., 2019).

Since technical programs combine general and vocational education, transitioning from general to vocational programs is possible and frequently done. The majority of students acquiring technical secondary education do so after graduating from secondary school (Portela Souza, et al., 2015, p. 8). Typically, VET programs take three or four years to complete, but the duration can be decreased by up to two years for individuals who have already completed or begun general secondary education (Monroy et al., 2019). Despite the steady increase in participation in vocational and technical programs over the past decade, the percentage of students enrolled in a secondary vocational and technical program is relatively low at 24.7% of all secondary students in 2018 (INEP, 2020d).

3.2 Professional Education and Training (Post-Secondary Level)

Both public and private universities offer PET at the undergraduate level, although private faculties dominate this sector (ESMU, 2012, p. 14). The institutions that offer undergraduate PET—the so-called higher technologist programs (tecnólogos)—are referred to as universities of applied sciences. They are located at the same level as regular universities, where students can complete a bachelor's academic program (bacharel) and the pedagogical teacher program (licenciatura).

[11] As described in more detail in the previous chapter, the general education curriculum includes the subjects Portuguese, a foreign language, mathematics, biology, chemistry, physics, geography, and physical education.

Just as for regular universities, a degree from a general or technical high school is required for universities of applied sciences, as is the ENEM national baccalaureate examination (Kauer, 2015, p. 45). With the conclusion of such a technologist program, students obtain a diploma (diploma de técnico de nível médio) that grants access to a nominal one-year professional postgraduate program (mestrado professional) or to a university graduate programme with certain exemptions. This is in contrast to most other educational systems in Latin America, where students at universities of applied sciences are not allowed to enter either a professional master's degree or a university graduate program (Monroy et al., 2019).

PET programmes are not limited to technical areas and are also offered in the fields of the arts, commerce, communication, design, informatics, health, tourism and management. By far the most popular technological undergraduate major in 2018 was business (Globo, 2018). The share of undergraduates with a technological degree is roughly 13%, while the majority of 68% pursue a general academic bachelor's program at a university (INEP, 2019). Technical higher education programs have a duration of two or three years, which constitutes a minimum course load of 1,600 to 2,400 hours depending on the specialisation selected. A further internship also forms an integral part of the curriculum.

3.3 Regulatory and Institutional Framework of the Vocational Professional Education and Training System

3.3.1 Central Elements of Vocational Professional Education and Training Legislation

The basic legal framework of the today's VPET system in Brazil is the LDB of 1996 and Decree 5154/04, which regulates the basic education law with respect to the VPET. This legislation defines the National Board of Education (Conselho Nacional de Educação) as the main regulatory body of the VPET system. At the federal level, the MEC is responsible for designing VPET policy, monitoring and evaluation. The MEC is also responsible for establishing the CNCT, which lists all nationally authorised technical courses and their minimum academic curriculum requirements (see Section 3.5.1 for more information about the CNCT). The state secretariats of education of science and technology have similar functions, but at the state level. Additionally, each state has its own regulatory framework, which defines the Boards of Education (Conselhos Estaduais de Educação) as the regulatory agents responsible for VPET regulation in accordance with national legislation (Almeida et al., 2016, p. 32).

3.3.2 Key Actors

Vocational and Professional Education and Training

Representation and Advisory Bodies

The National Institute for Educational Studies and Research (INEP) is a research and advisory agency linked to the MEC that was founded in 1937. Its main goal is to assess basic and higher education in Brazil. More specifically, the INEP gathers educational statistics and generates research that helps policymakers monitor, formulate and implement public policies for education. Furthermore, the INEP is also responsible for international assessments and indicators, such as the PISA (INEP, 2020c).

The National Council for the Federal Network of Vocational, Scientific and Technological Education Institutions (CONIF) comprises a wide range of society's different representations and ultimately helps the MEC to establish sound vocational education policies. It provides various stakeholders (e.g., leaders of federal institutes of education, science and technology and members of the parliament) with an arena

for discussing, proposing and promoting policies for the development of vocational and technological education, research and innovation (UNESCO-UNEVOC, 2020).

The CONIF oversees all federal institutions of vocational education, science and technology and ultimately helps the MEC to establish sound vocational education policies. The CONIF provides a central arena for various stakeholders and policymakers, enabling and promoting policy learning and exchange among different federal institutions (UNESCO-UNEVOC, 2020).

The Brazilian VPET system shows a lack of constructive dialogue among different stakeholders and advisory bodies. This mainly manifests in the significant mismatch between VET supply and labour market demand discussed at the end of Section 3.1. Most relevant to this discussion, a recent study by the WEF has found that a major contributing factor to this mismatch is the disconnection and lack of exchange between VPET institutions and relevant stakeholders. The report concluded that a more consistent and structured engagement of all relevant stakeholders of the VPET system is much needed in Brazil to enhance the interaction between academia and both the business sector and civil society (WEF, 2015, p. 28).

Education and Training Providers

The main VPET providers in Brazil are private providers and the S System. The S System (Sistema S) is a private network of technical institutions that provide the National Service for Apprenticeship and are mainly financed by payroll taxes from companies in their economic sector (for more information on the S System, see Box 1). Almeida et al. (2016, p. 70 et seq) explore data from the National Institute of Studies and Research and break down student enrolments at secondary and postsecondary levels across different education and training providers. They found that in 2014, private enrolments accounted for 47% of the total student enrolment at secondary and postsecondary levels, S System for 41%, state providers for 9% and federal providers for 3%.

Public education and training providers can be divided into a federal network and a state network. The public federal VPET provider is the so-called Federal Network of Vocational Education that includes three types of institutions: (a) federal institutes, (b) technical schools associated with federal universities and (c) technological centres and universities. Next to the federal level, there are also public education and training providers at the state level. This state network comprised of state technical universities focuses on tertiary education, and state technical schools focus on upper secondary education (Portela Souza, et al., 2015, p. 9). Municipalities also offer vocational training programs, but these represent a negligible share of VPET enrolments (Almeida et al., 2016, p. 24).

Box 1: The S System

Technical institutions of the S System are private non-profit organisations financed, managed and led by firms. Each of the nine institutions of the S System is mainly financed through payroll taxes collected from the industries or economic sector linked to each institution. These schools offer vocational education at the secondary and tertiary education level as well as short-term FIC courses (OECD, 2018, p. 32).

S System institutions have a central role in the delivery of FIC courses because they provide more than 80% of all courses (Almeida et al., 2016, p. 71).[1] The parastatal educational institutions of the S System were established by the Brazilian government in the early 1940s to encourage vocational education and training. The S System is primarily financed through a collective arrangement where companies fund such training through a payroll levy scheme (Portela Souza, et al., 2015, p. 12). This transfer system requires firms in the agriculture, trade, manufacturing and transportation sectors to pay a predetermined fraction of their payroll for the training of their sector's labour force to the technical schools of the S System (OECD, 2018, p. 34).

The first institution of the S System was regulated by decree (4,048/1942) and was called the SENAI (National Service of Industrial Apprenticeship). Soon after, the system was extended to the SENAC (National Service of Trade Apprenticeship). While the SENAI was created to provide skilled labour force for industrial occupations, the SENAC fulfilled this educational role for the commerce and service sector (Barbosa, et al., 2015, p. 5). While the first two institutions of the S System—the SENAI and the SENAC—stand out as the most important providers of FIC, technical courses and technological programs, seven other institutions were established successively.

Each of the nine independent non-profit private organisations of the S System is specific to economic sectors.[1] These institutions are organised at the national and state levels and focused on professional training, social assistance, consulting, research and technical assistance (Costal et al., 2018). The S System network of training providers serves two main purposes: improving the quality of life of the labour force employed in this economic sector and providing VPET to meet the demands posed by the economic sector. The S System offers free courses and paid courses, while the latter is usually at more attainable prices in comparison with private schools. Institutions from the S System established vocational training schools not linked to a particular job or company, and courses are opened to any current or prospective worker of a specific sector.

Private education and training providers collaborate with the federal government and can broadly be divided into (i) private vocational schools, (ii) private universities and (iii) institutions of the S System (Portela Souza, et al., 2015, p. 10). Each of the three main providers offer programs at all three different duration and qualification levels: FICs, technical education (upper secondary level) and technological courses (tertiary level; Almeida et al., 2016, p. 24). The short-term FIC programs are not tied to the formal education system and consequently are not regulated by the MEC. Instead, they are regulated by the Ministry of Labour and Employment of Brazil (Ministério do Trabalho e Emprego, MTE), mainly because these courses are of a very local nature and are not intended to be standardised and offered as a nationally catalogued VET program (Almeida et al., 2016, p. 25). Technical and technological

courses are longer-term programs that form part of the formal education system and have upward permeability, primarily offered at the upper secondary and tertiary level and managed by the MEC (OECD, 2018).

Government

Responsibility for the VPET system falls within the remit of the federal government and the states (MEC, 2008). The Secretariat of Vocational and Technological Education at the MEC is responsible for the coordination and monitoring of VET policies. More specifically, the secretary manages policy implementation, promotes the expansion and improvement of vocational and technological education and monitors compliance to the law (Almeida et al., 2016, p. 71).

The MEC establishes the National Education Plan in cooperation with the National Council for Education. The provision of VPET is a shared responsibility of the MTE and the MEC. Both ministries coordinate a vocational training policy, which is executed by technical schools, federal institutes of vocational education, and the S System (Barbosa, et al., 2015, p. 9).

3.4 Financing of the Vocational Professional Education and Training System

The landscape of VPET institutions in Brazil is highly fragmented, and monitoring standards are relatively low because in many countries in the region the analysis of educational finance in the Brazilian VPET system suffers from the lack of available statistical information (ECLAC, 2019, p. 43). Due to the lack of comprehensive information, we cannot provide a discussion of clear and detailed financing schemes of all relevant VET institutions. Instead, we first broadly discuss the general investments in the VPET system and then elaborate the better-known financing scheme of the S System network providers (see Box 1).

A recent WB report has estimated the annual investment in the VPET at approximately US$3 billion, representing roughly 40% of the total expenses on education (see Section 3.4.2 for a more detailed discussion of the government expenditure on education; 2015, p. 36). This amount stems from two roughly equal parts of private sources and public financing.

While the funding mechanisms of the public sector are the most opaque, the private-public, parastatal institutions of the S System funding structure are better known. Therefore, this chapter focuses mainly on the funding system of the S System technical schools, one of the largest providers of VET in Brazil. Its institutions are responsible for the provision of approximately 43% of vocational and technical education in Brazil in 2014, offering courses at both secondary and tertiary levels as well as short FIC courses (Portela Souza, et al., 2015, p. 5). Although such short-term FIC courses are not part of formal education, they comprise a significant share of technical training. With 89.5% of the FIC courses being offered by the S System's institutions while the rest lies in the responsibility of the federal and state technical networks, this makes a great case for the S System's importance for the Brazilian VET provision (Portela Souza, et al., 2015, p. 6).

In the following section, we structure our discussion of educational finance of the VPET system around private and public institutions. The primary reason for this is that fact that many institutions offer vocational and professional training courses at the upper secondary, tertiary and even informal education levels.

3.4.1 Financing of the Private Vocational Professional Education and Training System

Private VPET providers may be subdivided into two subgroups: (a) private vocational schools and universities and (b) institutions and technical schools of the S System. Due to the aforementioned limited information availability and the high fragmentation of private VPET providers, we focus on the financing of the technical schools and institutions of the S System.

The S System institutions' primary source of income is sector-specific firm levies. The fiscal authority collects these earmarked training levies in the form of a payroll tax on firms operating in a specific sector. These funds are allocated among the nine educational institutions that make up the S System. These funds added up to approximately three quarters of total public expenditure on secondary education in 2010 (Almeida et al., 2016, p. 36). Levies are usually set at between 1 and 2% of the total wages bill of the enterprise (Ziderman, 2016, p. 5). The contribution rates for the company levy scheme vary across sectors (i.e., for each of the nine different institutions of the S System) and are on a similar level as OECD countries' training levies (OECD, 2018, p. 34 et seq). On a national level, the revenues mobilised by VPET-related payroll taxes are economically significant. These tax instruments' revenues accruing to the Brazilian System S institutions comprised 0.29% of the total GDP in 2017 (ECLAC, 2019, p. 34).

In light of the COVID-19 pandemic, the S System's contribution rates have been adjusted to reduce the financial burden for private businesses. Decree 932/2020 temporarily reduced the mandatory contribution rate of corporations by half. This rule had one exception because the SEBRAE's contribution rate has been unchanged (Ortevo, 2020). Previous rates of the SENAC, SENAT and SENAI stood at 1% (new rate 0.5%); SESI, SESC and SEST at 1.5% (new rate 0.75%); SENAR and SESCOOP at 2.5% (new rate 1.25%) and SEBRAE at 0.6% (rate unchanged).

Box 2: Financing of the SENAI

The SENAI is the largest institution in the S System in terms of training capacity, currently offering approximately 1,600 FIC courses, 1,100 technical courses (upper secondary level), 80 technological programmes (tertiary level) and 120 postgraduate courses (Almeida et al., 2016, p. 29). It is noteworthy that the SENAI also offers its own distance learning system with over 220 courses (see Section 3.5.2 for more information on distance learning). SENAI technical schools thus offer approximately 38% of all FIC courses, 35% of all technical courses and 15% of all technological programmes taken by workers in industrial sectors (OECD, 2018, p. 36).

The financing modalities of the SENAI built on a 1% payroll tax levied on all firms operating in manufacturing, transportation, communication and fishing sectors. Contrary to other countries in the region (e.g., Uruguay, Venezuela), VPET-related payroll taxes in Brazil are only levied on employers and not on employees. However, this economic burden is rolled over entirely on workers in form of lower wages (ECLAC, 2019, p. 33). Additionally, businesses larger than 500 employees are required to pay an additional 0.2%. This tax is collected by the fiscal agency in charge of social security and is complemented with government subsidies and then transferred to the SENAI (OECD, 2018, p. 33).

Federal law regulates how the earmarked funds are allocated within the SENAI. One per cent are used to cover the costs of the SENAI's administration, 15% are retained by the central administration to perform redistributive actions by allocating supplementary resources to less developed regions of the country and the remaining 84% are transferred equally to the regional bodies of the SENAI (OECD, 2018, p. 33). Companies are exempted from both the 1 and 0.2% levies if they agree to direct the corresponding savings to firm-based training programs.

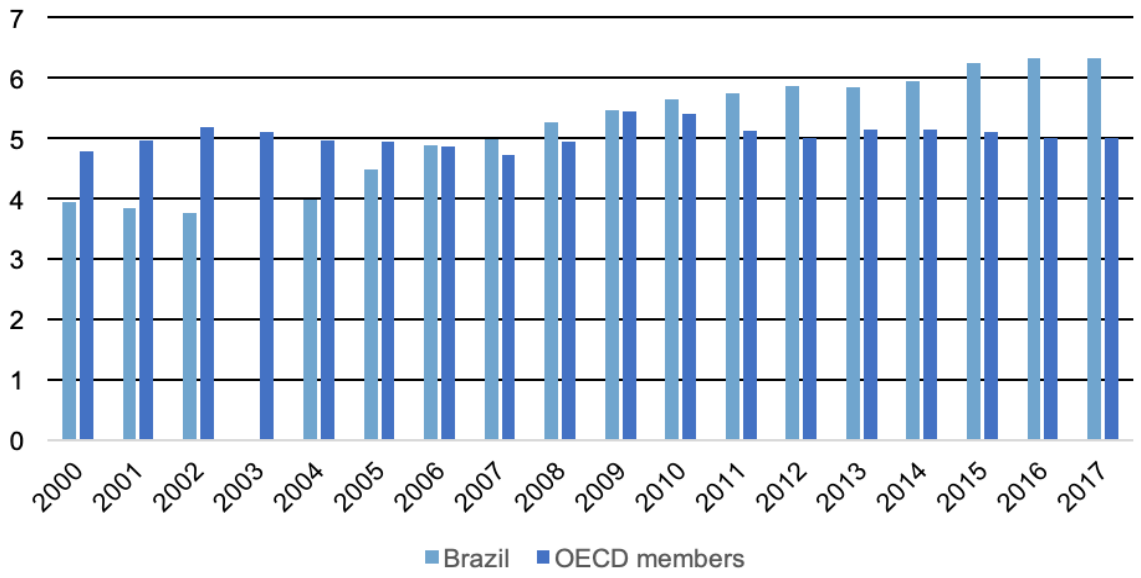
Over the course of the last decade, there has been a clear trend of technical schools of the S System diversifying their revenue streams. Currently, public funding is supplemented by tuition fees as well as fees for consultancy and research services. Some institutions have diversified their income even further and raised a significant share of their income from other sources not directly related to their educational service provision. For SENAC, for example, capital income in the form of property rentals comprised

more than 10% of its annual income in 2018 (ECLAC, 2019, p. 34). Furthermore, the private technical schools of the S System have also begun to offer training services for specific companies directly, such as selling firms job-specific training services (OECD, 2018, p. 32). S System schools also charge a tuition fee, although this is heavily subsidised. The gratuity agreement between the network of course providers and the government required these institutions to use 60% of total tax revenues towards subsidising training (Almeida et al., 2016, p. 6). Furthermore, the gratuity agreement also established that part of the levy-based funding must be used to provide free education to more socioeconomically disadvantaged people (OECD, 2018, p. 34). Since the financing of the nine independent institutions of System S varies significantly, Box 2 focuses on the financing system of the SENAI, which is the most important institution in the S System.

3.4.2 Financing of the Public Vocational Professional Education and Training System

As in many countries in the region, only very limited data on educational finance of the public VPET system are disclosed in Brazil. Consequently, there is a lack of available disaggregated statistical information on government spending on formal VET programmes at the upper secondary and tertiary levels (ECLAC, 2019, p. 43). To the best of our knowledge, there are no specific budget lines for technical education in Brazil. Therefore, in figure 11 we compare Brazil and OECD member countries' total public expenditure on education from 2000 to 2017 as a percentage of national GDP. While OECD member countries' public spending has fluctuated around the 5% mark over the last two decades, Brazil's public spending on public education has increased significantly by more than 50% during this period. Unfortunately, there is no disaggregated dataset for public expenditure on VPET.

Figure 11: Government Expenditure on Education Total (% of GDP), 2000–2017



Source: own figure based on UNESCO (2020).

Nevertheless, a recent report from the Inter-American Development Bank found that the Brazilian federal government spending on vocational education in 2007 accounted for approximately 0.04% of the total GDP. In 2013, the government spent an equivalent of 0.2% of the GDP on VPET (2015, p. 1). This drastic relative increase of approximately 500% in just six years is in line with the general trend of increasing spending on education, but at a much faster pace.

Since VET constitutes part of the Brazilian basic education system, the financing of upper secondary vocational education in Brazil is financed through the FUNDEB. The FUNDEB requires 20% of state and municipal revenues to be allocated to the education fund. The federal government is mandated to

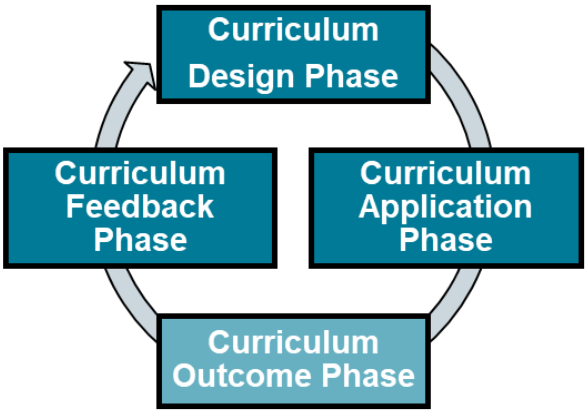
contribute another 10% of this total value (Almeida et al., 2016, p. 36). As the federal legislation furthermore defines a minimal expenditure per pupil, the federal government is also mandated to supplement insufficient state and municipal contributions (Ulyssea et al., 2006). The revenues of the FUNDEB are allocated based on each state's level of enrolment in basic education. More specifically, the FUNDEB allocates financial resources according to the number of students per education level. The average expenditure per pupil in vocational high school in 2008 was three times as high as the expenditure for a pupil in traditional general high school (Almeida et al., 2016, p. 37).

While state, municipal and federal government revenues are the dominant form of financing the formal education system, another form of government income for education is noteworthy. Brazil has been the principal recipient of bilateral official development aid for education in the past two decades. Although the importance of development aid for the federal educational budget has steadily decreased over time as Brazil has reached middle income status, the country has received US$1.01 billion for education over the period from 2008 to 2017. Of this amount, only a relatively small part (US$ 22 million) was directly allocated to secondary vocational education (ECLAC, 2019, p. 58).

3.5 Curriculum Development

Curriculum is a central element for the functioning of a VPET system because it defines the framework and the (quality) standards for the education system. The development of a curriculum can be decomposed into a three-step process with curriculum design, curriculum application and curriculum feedback phases. This theoretical concept is called the curriculum value chain and is depicted in Figure 12 (for more details, see Renold et al., 2015; Rageth & Renold, 2019).

Figure 12: Curriculum Value Chain



Source: Renold et al. (2015) and Rageth & Renold (2019).

In the curriculum design phase, the relevant actors decide upon VET curriculum content and qualification standards. Therefore, the discussion in Section 3.5.1 focuses on the degree and the amount of stakeholder participation concerning curriculum design in Brazil. The curriculum application phase revolves around the implementation of the curriculum. Because learning environments differ substantially across countries, especially with respect to the prevalence of workplace learning, Section 3.5.2 focuses on the curriculum application phase. Specifically, it addresses where learning takes place and whether the curriculum dictates both school and workplace learning or only one of the two. Finally, curriculum outcomes can be collected and analysed in the curriculum feedback phase. Section 3.5.3 focuses on the curriculum feedback phase. This evaluation process is important because it may render a more refined curriculum design than was possible in the first place.

3.5.1 Curriculum Design Phase

The design phase is crucial for the whole curriculum process. To ensure that the skills taught in the VPET programmes correspond to the needs of the labour market, experts from companies should be involved in defining the qualification standards and learning content of the curricula.

The MTE and the MEC work together to define vocational training policy (IBE UNESCO, 2006). With the goal of adjusting vocational training to the needs of the labour market, the MTE promoted the re-structuring of the National Qualification Plan (Plano Nacional de Qualificação, PNQ). The PNQ is an important framework to develop federal government actions in partnership with states, municipalities, the federal district and relevant stakeholders from the private sector (OAS, 2017, p. 19 et seq.)

The MEC is also responsible for establishing the CNCT listing all nationally authorised technical courses and the minimum academic requirements for education providers. In this national catalogue, the MEC defines the skills and knowledge students must learn during these technical courses to be proficient in their occupations. More specifically, the catalogue specifies the curriculum, minimum required hours of training and minimum entry requirements to register (age or level of education) for each course (OECD, 2018, p. 90). Additionally, with this national catalogue, the MEC also define the infrastructure required to teach each individual technical course and a recommended program duration. However, the MEC does not establish a detailed curriculum for each program, including whether they require an on-the-job learning component, and thereby leaves the detailed curriculum development to the educational providers (Almeida et al., 2016, p. 32 et seq.). As a consequence, VET programs across the country and the different educational providers vary considerably in terms of curriculum and quality.

The 2020 CNCT lists 220 programs organised in 13 technological areas, which can be understood as organised and systematised sets of knowledge, skills and abilities of different orders (e.g., scientific, legal, political, social, economic, organisational, cultural, ethical, aesthetic, etc.).[12] Each area gathers a group of courses, indicating for each one the minimum workload; professional completion profile; minimum infrastructure required; field of activity; occupations associated with the Basic Classification of Occupations (Classificação Basica de Ocupações CBO); standards associated with professional practice and possibilities of intermediate certification in professional qualification courses, continuous training in specialisation courses and verticalisation for graduation courses in the formative itinerary (MEC, 2020c).

Private and public VET providers are allowed to offer any course listed in the CNCT. They typically conduct an analysis with local employers and therewith identify the specific local need for skills. Based on this demand-side analysis, educational providers adjust the technical courses to optimally fit local demand. However, many criticise that meeting labour market demands with vocational training remains a challenge and employers and labour unions should have a larger say in curriculum development to ensure that the skills taught reflect the ones needed (see e.g., Almeida et al., 2016; Portela Souza et al., 2015).

3.5.2 Curriculum Application Phase

The way in which a curriculum is implemented, especially with respect to learning environments, is important to achieve the intended learning outcome. In Sections 3.1 and 3.2, this factbook describes how most technical VET programs (upper secondary level) in Brazil have a school- and a work-based component, while PET programs (postsecondary level) are predominantly school based. Since the learning environment is an important sub-dimension of the curriculum application phase, this section

[12] A list of all courses from the catalogue can be accessed at https://www.cps.sp.gov.br/wp-content/uploads/sites/1/2020/11/CATALOGO-NACIONAL-DE-CURSOS-TECNICOS-2020.pdf

elaborates on the different modes of delivery of VET programmes, including classroom, distance and workplace learning.

The predominant mode of delivery of upper secondary technical education is classroom based. Workplace learning in the form of apprenticeships is neither offered through all types of VET providers nor required by the CNCT as part of the curriculum for most technical programmes (Almeida et al., 2016, p. 23). The catalogue defined by the MEC states that workplace learning should occur in addition to and not in lieu of the minimum required classroom lectures (Almeida et al., 2016, p. 56). Thus, the decision to include a mandatory apprenticeship in the curriculum for the successful completion of a VET program is left to the VET provider. While S System providers of technical courses typically require a mandatory apprenticeship as part of their curriculum, some institutions have removed apprenticeship as a required component of technical education due to a lack of available apprenticeship opportunities. Many scholars see this trend of moving away from the traditional VET programme that includes a hands-on modality in the workplace as a result of the difficulty in finding employers willing to provide such on-the-job training, which in itself is a signal that too few employers perceive real labour market value in these VET programmes (see e.g., OECD, 2010). Therefore, many researchers argue that the MEC needs to establish more efficient VET programmes that are oriented towards the demands of students and companies alike (see e.g., Almeida et al., 2016; OECD, 2018). Since workplace training is not fully integrated in most VET curricula but rather a complementary experience in addition to compulsory classroom teaching, there are few regulations for learning in the work environment.

A third and increasingly important mode of delivery in VET programmes in Brazil is distance learning. This innovative government initiative to explore the use of technology in VET delivery was established in 2007 when the MEC established the E-TEC Brazil Network Program (Rede e-Tec Brasil). Its mission was to supply free technical courses with distance learning, primarily to serve peripheral regions of the country lacking professional training (Costa & Libâneo, 2018, p. 1). This modern form of education was promoted at all levels, including FIC, upper secondary and tertiary technical courses (Portela Souza et al., 2015, p. 17). The E-TEC Network offers technical courses through a broad variety of providers, including the Federal Network of Institutes of Professional Education in Science and Technology, the S System and state education institutions (Almeida et al., 2016). Brazil is one of the few countries that has piloted and promoted long-distance learning, which presented itself as a viable option especially for the rural regions with low population density (World Bank, 2015, p. 36). As a consequence of the efforts to extend and supply online distance VET, the enrolment in the distance learning modality for technological courses was approximately 46% in 2017 (Globo, 2018).

3.5.3 Curriculum Feedback Phase

The curriculum feedback phase deals with the questions of whether and how educational outcomes are analysed. Based on this, the curriculum could be reworked and improved. More specifically, we describe the monitoring and evaluation bodies in the VPET system responsible for feeding the information back to the system in order to improve the quality of the VPET programs. We describe the educational quality monitoring and assurance efforts of the most important providers of technical education, the public network of federal-level and state-level schools and the S System (see Box 1 for more information on the S System).

In Brazil, the MEC and the National Institute of Studies and Research (Instituto Nacional de Estudos e Pesquisas, INEP) periodically collect and administer three exhaustive datasets for technical education students in the public network of federal- and state-level schools and the network of institutions of the S System. Unfortunately, although these outcomes are regularly gathered and analysed, they are seldom utilised to inform policymakers in technical education and hence result in updating and redesigning the curriculum (Almeida et al., 2016). Furthermore, none of the below listed institutions gather panel datasets of the students, tracking their transition into tertiary education or into the labour market, which would be of tremendous importance for future policymaking.

The National Information System for Vocational Education and Technology (Sistema Nacional de Informações da Educação Profissional e Tecnológica, SISTEC) collects monthly administrative information about enrolled students, offered courses and individual tuition fees for schools providing VET courses. The SISTEC also collects data on FIC courses, but only for educational institutions that provide formal VET courses on the upper secondary level (MEC, 2020d).

The School Census of Basic Education is an annual survey conducted by the INEP in collaboration with the MEC and Municipal Education Departments and is compulsory for public and private institutions of basic education as determined by Decree 6425/08. All schools that provide basic education are required to participate in this survey, and some of them also provide VET or PET. The School Census collects nationwide data on a broad range of relevant indicators and thus constitutes the main source of information for policymakers to implement changes in the curriculum and reallocate public educational resources through the FUNDEB. Among other variables, the School Census collects data on student enrolment and dropout rates, teacher education and educational spending (INEP, 2020a, p. 5).

Finally, the School Census and the SISTEC are complemented by the federal network of VET providers who also engage in systematic data collection. This initiative primarily collects data on student enrolments, repetition and dropout rates (Almeida et al., 2016, p. 41).

3.6 Supplying Personnel for the Vocational Professional Education and Training System (Teacher Education)

The LDB of 1996 serves as the central regulatory framework for teacher education. Following the global trend, this law requires teachers at all levels of education, including the vocational and professional education levels, to have a university degree, whereas teachers previously only needed a high school education (Barretto, 2015, p. 681). Although the LDB has increased the educational requirements for the teaching profession and made teacher training free, improving the quality of teaching remains a priority for the MEC (World Bank, 2015, p. 36 et seq.). The 2012 school census revealed that there are nearly 72,000 vocational teachers (funções docentes), the vast majority of whom have a university degree (91%; Almeida et al., 2016, p. 34). According to the newest 2020 school census, 97.1% of high school teachers have completed higher education (89.6% with an undergraduate degree and 7.4% with a bachelor's degree) and 2.9% have secondary or lower education (INEP, 2020e, p. 47).

Although upper secondary vocational education is part of the Brazilian basic education system, teacher training is very different from general upper secondary education (Almeida et al., 2016, p. 34). Vocational teachers at the upper secondary level tend to be better qualified than teachers at general upper secondary schools. In addition, the salaries and career trajectories of vocational teachers tend to be higher and better than those of general secondary school teachers (Almeida et al., 2016, p. 34).

Almeida et al. also note that public schools (including the private-public schools in the S System network) select teachers through public tenders that take into account the level of academic training, the results of knowledge tests and previous teaching performance. After acceptance and a successful probationary period, vocational teachers in public schools are given a long-term contract and cannot be terminated unless there is serious misconduct. Almeida et al. attribute the higher average qualification to the more competitive recruitment process and to the fact that more qualified candidates compete for the package with greater job stability and higher remuneration (2016, p. 35).

4. Major Reforms in the Past and Challenges for the Future

4.1 Major Reforms

The VET system in Brazil has a long history dating back to the late 19th century, when a preliminary apprenticeship school model was created. The foundation for today's apprenticeship schools was laid in 1909 with the establishment of 19 apprenticeship schools. Today, these schools are considered the starting point of a national VPET policy, which led to the creation of the Federal Network for Vocational and Technological Education and now has more than 700 sites across the country.

The rise of vocational education was closely linked to the abolition of slave labour and the country's need for skilled factory workers. In the early days, vocational training was exclusively attended by the poor and disadvantaged and thus strictly separated from formal education, and such training did not grant access to higher schooling. This negative connotation and the strict separation of vocational and general education is the subject of ongoing debate and a variety of legislative changes and amendments (Barbosa, et al., 2015, p. 5).

The most important VET reforms in Brazil are the following (more information on VET policy reforms can be found in Kauer, 2015, p. 56 et seq. and Cherman et al., 2013, p. 16 et seq.):

- In 1909, Decree 7.556 established 19 schools of craftsmen and apprentices (Escolas de Aprendizes Artífices) for the socioeconomically disadvantaged. The main objective of this training program was to provide relevant skills and deter students from criminal activities by distracting them with work.
- In 1937, Law 378, article 129 defined VET provision as a duty of the state, increased the scope of subjects and grades and renamed the schools of craftsmen and apprentices as professional lycées.
- In 1942, Decree 4.073 created a formal structure for vocational education. This amendment regulated a number of courses and defined a core curriculum. Although this amendment defined vocational education as secondary education, it did not grant its students access to higher education.
- In 1942, Decree 4.048 established the SENAI.
- In 1946, Decree 8.621 established the SENAC.
- In 1950, Decree 1.076 allowed VET students to enter higher education. Students had to demonstrate sufficient knowledge in subjects not covered in their VET curriculum.
- In 1961, Decree 6.052 allowed all secondary level VET students to enrol in higher education (without further examination).
- In 1971, Decree 5.692 required all high schools to offer VET courses in a concomitant modality. This amendment furthermore made VET courses mandatory for all high school students.
- In 1982, Decree 7.044 repealed compulsory VET participation for high school students.
- In 1996, Decree 9.394 established the LDB and defined curricula based on competencies.
- In 2004, Decree 5.145 enabled the integration of general academic high school and VET curriculum.
- In 2007, Decree 6.095 established the integration of all kinds of VET schools and technological universities into a new organisation called federal institutes of education, science and technology.
- In 2011, Decree 12.513 established the National Programme for Access to Technical Education and Employment with the objective of granting scholarships in technical courses and IFC programmes for private and public institutions. The program aims to expand access and increase the quality of VPET courses.

4.2 Major Challenges

The major challenges related to VET provision in Brazil are multidimensional and encompass the entire educational cycle from unequal access to VET courses to different socioeconomic clusters of society to the skill mismatch and failed transition into the labour market. This section explores two prominently discussed challenges in the literature, including the skill mismatch of the workforce and the labour market and the heterogeneous landscape of VET providers.

A major concern with the Brazilian VET system is the mismatch of supply and demand of skills with the labour market and industry needs and the resulting high unemployment rate (Portela Souza, et al., 2015, p. 23f). According to a recent study of the National Confederation of Industry (2014), 39% of secondary VET graduates have never worked in the area of their professional training. This suggests a deep skills gap and mismatch in Brazil's labour market. Another figure by the WEF (2015, p. 16) shows the great mismatch between VET supply and market demands: 68% of managers have difficulty filling vacant positions because of a lack of necessary training, with technical positions being the most difficult type of positions to fill. A recent OECD report disaggregated employers' hiring difficulties and found that in 2017, 41% of employers reported a lack of hard skills and 17% a lack of soft skills required (OECD, 2018, p. 37).

These numbers shed light on the great skills gap in the Brazilian labour market and show that the VET system needs to better monitor, understand and incorporate market demands in the provision of skilled labour. One recurring claim for this failure in the literature is related to the missing link between the CBO[13] and the CNCT (see e.g., Almeida et al., 2016, p. 33). The main argument is that there is too little articulation between both ministries, resulting in a forgone opportunity to match the demanded competencies within the existing occupations (identified in the CBO) with appropriate VET curricula designed to develop these same competencies (national catalogue).

Another concern with the Brazilian VET system that is surfacing in the literature has to do with the heterogeneous landscape of VET providers (see Section 3.3.2) translating into significant differences in training quality and a lack of comparability. This is potentially problematic insofar as the inadequate qualification of workers results in high unemployment (Cherman et al., 2013, p. 15). Such quality differences can be found in all aspects of training and among all kinds of institutions. Below are three of the most problematic differences between VET providers that can lead to large discrepancies in the quality of teaching (more detailed information can be found in OECD, 2018, p. 17).

- One such difference exists between private and public institutions with respect to tenure protections for teaching staff. While teaching staff at public institutions cannot be terminated or can only be terminated under severe self-infliction, private institutions have much more flexibility in the way they manage their teaching staff. This is believed to have a significantly positive impact on teaching quality in private institutions because they are more agile in adjusting their training to the changing demands of the labour market.
- A major difference between the organisation of the S System's institutions (for more information on the S System, see Box 1) and that of other training facilities exists in the provision of regular and formal quality assessments of FIC courses. While the training facilities from the S System engage in regular quality evaluations, most other FIC providers do not conduct such assessments, potentially resulting in a lower quality improvement rate.
- Another crucial difference which is not regulated across different VET providers has to do with training in non-traditional subjects such as teamwork and work ethics. While certain institutions complement professional training modules with such soft skill courses, many VET providers do not offer this type of support.

[13] The CBO is a document that identifies, describes and classifies all professions of the Brazilian labour market according to the International Statistical Classification of Occupations (ISCO-88) administered by the MTE.

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