RBEST Revista Brasileira de Economia Social e do Trabalho
BJSLE Brazilian Journal of Social and Labour Economics

https://doi.org/10.20396/rbest.v6i00.19973

ARTICLE

Vocational education and training in Latin America:
Comparative analysis of institutional trajectories and challenges in a world of labour transformation

*Carlos Alberto Suescún Barón**
*Sharim Samara Hernández Pérez***
*Juan Sebastian Giraldo Pedroza****
*Julián David Téllez Pérez*****

Abstract

This article arises from the need to understand the development of Vocational Education and Training (VET) systems in different socioeconomic contexts, focusing on four Latin American countries (Argentina, Chile, Peru, and Colombia) and the German case, to understand the current state and the differentiated dynamics of VET and its institutional structure. The German case – and its relative success in terms of articulation between training for work and business – constituted it as a reference for the evaluation of this type of institutions, which in the case of Latin America have not been unfamiliar with the policies of structural reforms based on the Washington Consensus (in some cases, they were privatised). The article is divided into three sections, which explain how vocational training programs work from a brief historical context, describing their operational structure, the legal framework from which they operate, the sources of funding, the main vocational training institutions, and their relationship with economic dynamics.

Keywords: Vocational education; Employment; Economic structure; Labour policies.

JEL: I25, J24, J88.

* Pontifical Xavierian University, Bogotá, Colombia.
Orcid: https://orcid.org/0000-0002-7767-6653. E-mail: sucarlos@javeriana.edu.co

** National University of Colombia (UNAL), Colombia.
Orcid: https://orcid.org/0009-0008-7177-2928. E-mail: shhernandezp@unal.edu.co

*** National University of Colombia (UNAL), Colombia.
Orcid: https://orcid.org/0009-0007-1313-1076. E-mail: jsgiraldop@unal.edu.co

**** National University of Colombia (UNAL), Colombia.
Orcid: https://orcid.org/0009-0000-8667-9429. E-mail: jutellezp@unal.edu.co

Note: Article derived from research conducted for The Union of Public Employees of the National Learning Service (SINDESENA) – National Board, entitled "Comparative analysis of vocational training institutions: The case of Colombia, Peru, Chile, Argentina and Germany" (2022).

Educação e formação profissionalizante na América Latina:
Análise comparativa de trajetórias institucionais e desafios em um mundo do trabalho em transformação

Resumo

Este artigo surge da necessidade de compreender o desenvolvimento de sistemas de Educação e Formação Profissional (EFP) em diferentes contextos socioeconômicos, com foco em quatro países latino-americanos (Argentina, Chile, Peru e Colômbia) e no caso alemão, para entender o estado atual e a dinâmica diferenciada da EFP e sua estrutura institucional. O caso alemão – e seu relativo sucesso em termos de articulação entre o treinamento para o trabalho e as empresas – constituiu uma referência para a avaliação desse tipo de instituições que, no caso da América Latina, não ficaram alheias às políticas de reformas estruturais baseadas no Consenso de Washington (em alguns casos, foram privatizadas). O artigo está dividido em três seções, que explicam o funcionamento dos programas de formação profissional a partir de um breve contexto histórico, descrevendo sua estrutura operacional, o marco legal a partir do qual opera, sua fonte de financiamento, as principais instituições de formação profissional e sua relação com a dinâmica econômica.

Palavras-chave: Educação profissionalizante; Emprego; Estrutura econômica; Políticas trabalhistas.

Educación y formación profesional en América Latina:
Análisis comparativo de trayectorias institucionales y retos en un mundo laboral en transformación

Resumen

Este artículo surge de la necesidad de comprender el desarrollo de sistemas de Formación Profesional (FP) en diferentes contextos socioeconómicos, centrándose en cuatro países latinoamericanos (Argentina, Chile, Perú y Colombia) y el caso alemán, para entender el estado actual y las dinámicas diferenciadas de la FP y su estructura institucional. El caso alemán – y su relativo éxito en términos de articulación entre la formación para el trabajo y la empresa – lo constituyó como un referente para la evaluación de este tipo de instituciones, que en el caso de América Latina no han sido ajenas a las políticas de reformas estructurales basadas en el Consenso de Washington (en algunos casos, fueron privatizadas). El artículo está dividido en tres secciones, que explican el funcionamiento de los programas de formación profesional a partir de un breve contexto histórico, describiendo su estructura de funcionamiento, el marco legal desde el que operan, su fuente de financiación, las principales instituciones de formación profesional y su relación con la dinámica económica.

Palabras clave: Formación profesional; Empleo; Estructura económica; Políticas laborales.

Enseignement et formation professionnelle en Amérique latine:
Analyse comparative des trajectoires institutionnelles et des défis dans un monde du travail en transformation

Résumé

Cet article est né de la nécessité de comprendre le développement des systèmes d'enseignement et de formation professionnels (EFP) dans différents contextes socio-économiques, notamment dans quatre pays d'Amérique Latine (Argentine, Chili, Pérou et Colombie) ainsi que dans le cas allemand, afin de comprendre l'état actuel et les dynamiques différenciées de l'EFP et de sa structure institutionnelle. Le cas allemand – et son succès relatif en termes d'articulation entre la formation pour le travail et l'entreprise – a constitué une référence pour l'évaluation de ce type d'institutions qui, dans le cas de l'Amérique latine, n'ont pas été étrangères aux politiques de réformes structurelles basées sur le Consensus de Washington (étant dans certains cas privatisées). L'article est divisé en trois sections, décrivant le fonctionnement de la formation professionnelle à partir d'un bref contexte historique, la description de la structure de son fonctionnement, le cadre juridique dans lequel elle s'inscrit, l'origine de son financement, les principales institutions de formation professionnelle et sa relation avec la dynamique économique.

Mots-clés : Enseignement professionnel; Emploi; Structure économique; Politiques du travail.

1. Comprehensive vocational education and training and the world of labour

Work under capitalism led from a relatively concentrated and rigid set of tasks and occupations to a rising division of phases, processes, and other forms of production organisation in factories, offices, workshops, and other concentrated spaces. However, this form of organisation is dynamic, it does not obey to a static criterion, and adjustments or innovations such as teleworking, the community workshop at home and the spread of Artificial Intelligence (AI) in diverse tasks and productive processes appear in contemporary times, simultaneously, as real transformations and challenges for the world of labour. These adjustments are more noticeable in countries with great heterogeneity in production, and with low participation of the industrial sector, as the case of Latin American countries.

These factors undoubtedly appear as challenges for a comprehensive vocational education and training, a right recognised in the declaration of human rights (art. 26) and in the regulations of several countries. The challenge is based on the relative importance of theoretical and empirical references in the institutional structure, which has been conceived from concepts such as the so-called "dual system" and the vulnerability of these institutions to reforms and technological innovations that affect their financing or the loss of their meaning at the socioeconomic level.

Related with technology change, AI represents a main challenge for the world of work, both in developed and underdeveloped countries. A greater automation lead by AI, however, not only represents the problem of the exponential replacement of labour by machines with generative capacity in their routines, in a speed that will clearly surpass the creation of new occupations; also reveals the potential impact on the current structure of rights associated with work and the very existence or legitimacy of the institutions created to guarantee them.

In the developed world, Germany appears as a reference of an institutional arrangement created to impulse the economic growth and simultaneously assures social protection to working class. Relating to vocational education and training, the influence of this case on other countries is due to the fact that the German system is representative due to its tradition, successful adoption by a significant proportion of secondary school graduates; and in line with this, the German VET (Vocational Education and Training) has been successful in articulating learning and the demands of the productive sector (educational relevance). In this process, the German model has been essential as a dual learning system.

Structural issues such as the recreation of the world of labour in the training space, through a theoretical-practical approach with a real replica in the workspace, is undoubtedly an aspect that is challenging due to innovations such as artificial intelligence (AI). However, this relative continuity of the work environment in different learning phases has become an essential factor in vocational education and training in different countries.

Labour, at least for now, constitutes the basic routine of humanity in the capitalist mode of production. To this extent, understanding the foundations of learning to perform work by attending to new patterns, forms or needs, is essential; in the same way that it is relevant to begin to elucidate the effects or needs generated by technological or social innovations in the world of labour.

Vocational education is a key to understanding the economic dynamics of various countries. Although there are different forms of training, there is a paradigm that has particularly impacted the institutional structures of Latin America, as is the case of Germany. In such manner, the comparative exercise conducted in this article, including a small sample of Latin American countries, as can be seen, is influenced by the VET system in Germany.

Contrary to the preconceived idea in many Latin American countries where a hierarchy has been established in education, placing higher education (university) at the top, VET is anything but residual in the German case. The need for qualified labour to respond the demands of the productive sector, its importance in the economic structure, the guarantee of a career path and recognition in public policy mean that VET is not a secondary chance.

In this way, carrying out a comparative analysis of vocational education models and their relationship with economic dynamics not only serves to understand the institutional arrangements, but also to visualise the potential effects brought about by innovations or transformations that occur directly in the world of labour, and which will of course affect training and vocational arrangements.

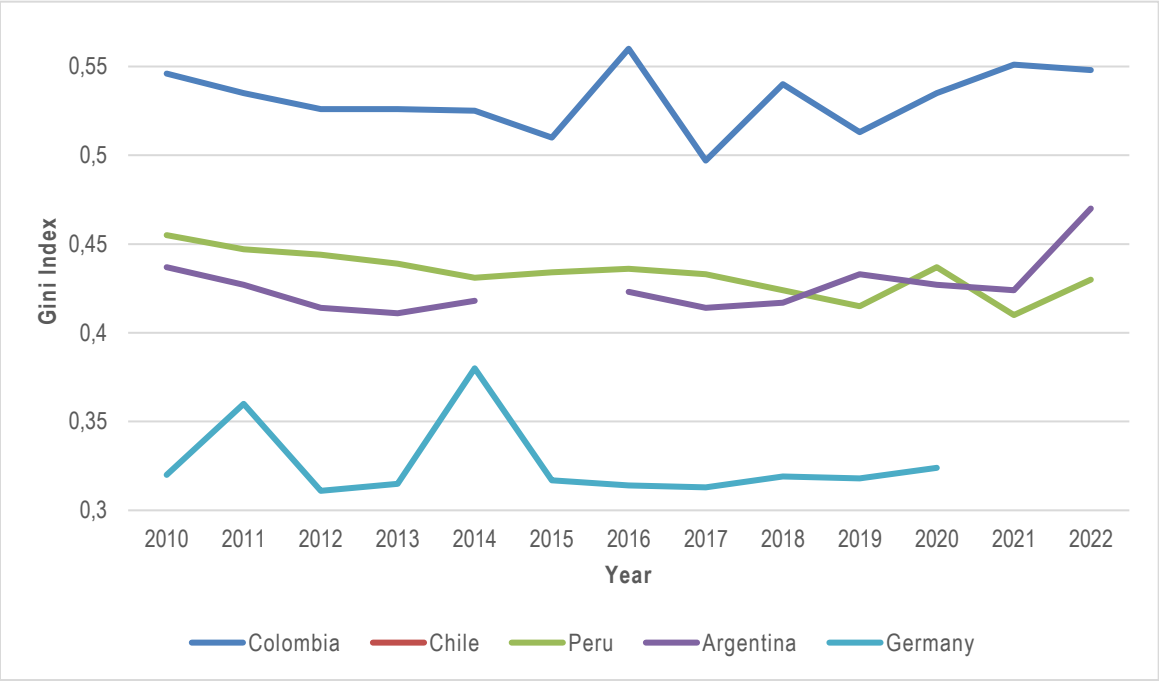
2. Germany: Vocational Education and Training (VET)

2.1. Germany's macroeconomic context

The German vocational education and training system is one of the most successful cases in the world. But this is possible thanks to a macroeconomic context that facilitates the conditions for training to be developed.

Germany, ranked as one of Europe's largest economies, has maintained moderate growth in recent years, despite facing three significant economic downturns: the 2008 financial crisis, the Covid-19 pandemic and more recently the geopolitical conflicts revealed in the war between Ukraine and Russia (Engler et al., 2023). According to OECD databases, over the past decade, GDP grew by an average of 1.2% annually, with a significant trade surplus, and an economy increasingly oriented toward the service sector, which accounts for more than 70% of GDP. Still, the manufacturing sector has seen a slight decline in its share, due to the slowdown in global trade, the rising costs of energy by effect of the conflict between Russia and Ukraine and the trade war between the United States and China.

Chart 1. Gini index, 2010-2022.



Source: World Bank (own elaboration).

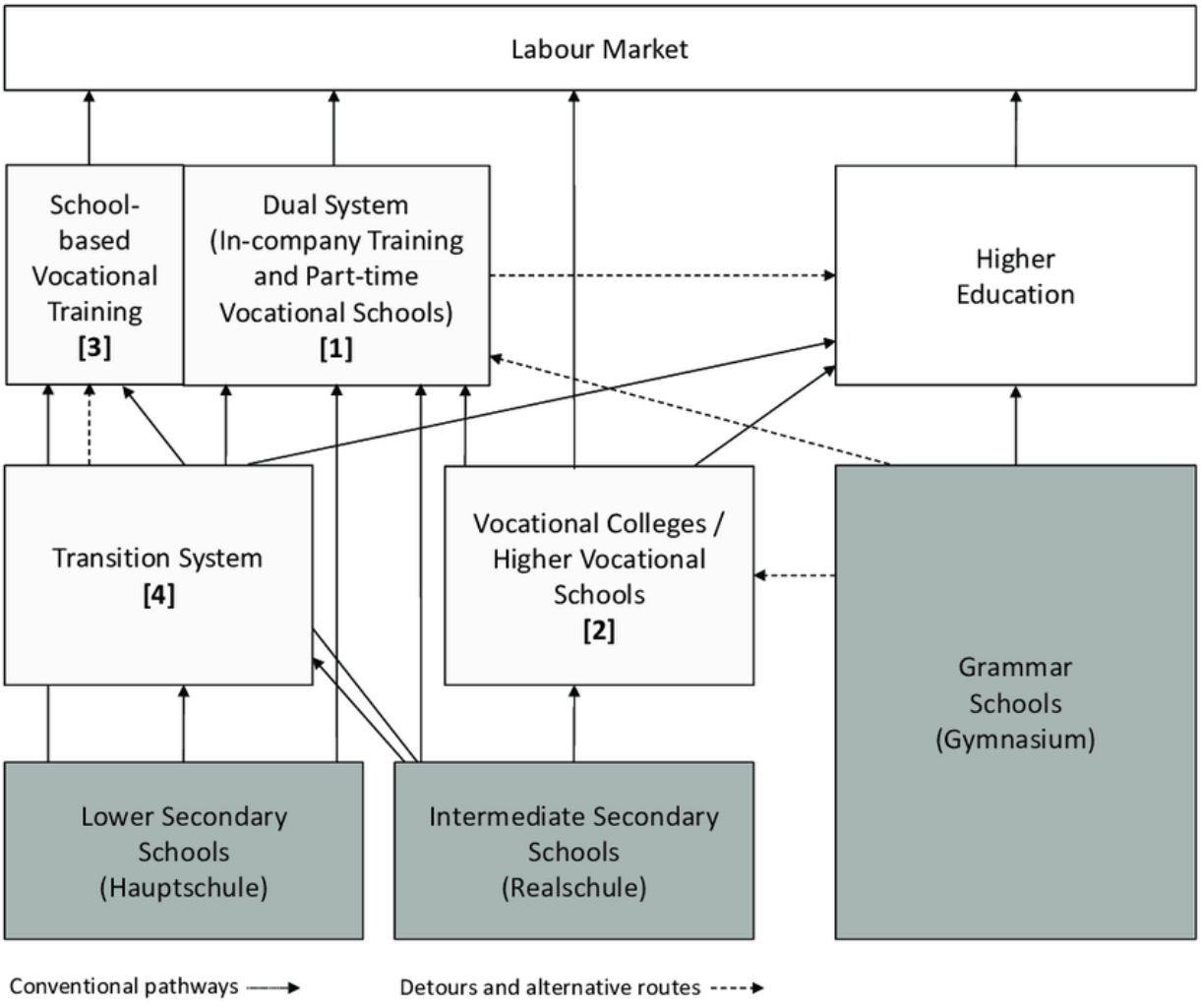
In the labour market, Germany stands out, managing to significantly reduce the unemployment rate, which fell from 7.1% in 2010 to a record low of 3.0% in 2023, although the pandemic caused a slight temporary increase. The service sector was the main generator of employment, driven by digitalisation and an ageing population, which caused an increase in the demand for services (health care or elderly care). Labour informality remained low, reflecting the strength of the country's social protection system and labour rights. As for the Gini index (Chart 1), an increase in inequality can be seen that remains constant over time, due to gender wage gaps, as well as by different socioeconomic groups such as migrants or people with disabilities (Engler et al., 2023). Demographics have also been a key factor, with

a relatively stable population thanks to immigration, although facing challenges due to ageing and a declining fertility rate, which has generated pressures on the labour market and the social security system.

2.2. Education system in Germany

The case of education in Germany is paradigmatic for recognizing the importance of technology incorporated into non-technical knowledge. Therefore, in the German educational system, methods were implemented to work with technology in the classroom so that the general population could learn and understand it.

Figure 1. German Education System and its relationship with labour market.



Source: Deissinger (2018).

Deissinger (2018), in agreement with Fürstenau et al. (2014), mentions that this model is based on three principles:

1) "Workplace-led" training, predominantly hands-on. Learning takes place around the workplace.
2) The "dual system", with learning scenarios in vocational school and the other corresponding to the company. However, it does not leave aside the State, since vocational education and training constitutes a policy related to economic development.
3) Considering the role of the State in vocational education, it is determined that both public and private or semi-private groups work hand in hand, and that workers and unions also influence the modernization and ordinances of this. In Figure 1 it is observed how the German Higher Education System works, according to Deissinger (2018).

2.3. Origin of the VET model

The historical development of the Vocational Education and Training model (VET) comes from traditional medieval craft training. In 1897, the "Craft Regulation Act" was passed, which allowed "craft chambers" to conduct examinations for masters and journeymen. The qualifications for these examinations were also limited techniques required for the transition from apprentices to skilled workers. By 1908, the right to train apprentices was restricted to "master craftsmen". The particular dynamics of vocational education and training in Germany and other countries have followed a pragmatism philosophy: the importance of living and experience in vocational education (Sennett, 2009).

Indeed, the "dual" part of the German system emerged at the beginning of the 20th century, when part-time vocational schools replaced continuing education schools, accompanying apprentices "through their vocation". Around 1925, chambers of industry and commerce began to adopt measures previously established in the craft sector (Deissinger, 2018).

Before VET, education was predominantly unrelated to training for occupations, apart from medicine, law, and theology. It was in the 20th century that degrees began to have relevance to the world of labour. Between 1960 and 1970, "the mass university" emerged. This led to the current German VET system, which, according to data from the European Centre for the Development of Vocational Education (CEDEFOP), is a system with 350 recognised occupations that absorb a significant proportion of young people between 16 and 19 years of age, and between 600,000 and 700,000 job opportunities have been

granted per year. In addition, small and medium-sized companies engage in a large part of the VET of young people in the country (CEDEFOP, 2020).

2.4. Structure of vocational training in Germany

Because of the significant development of VET in the 20th century, the "dual" system was established, which for Deissinger (2005), refers to the alliance between public, private and semi-private institutions to guarantee the three principles of the system mentioned above. All this is due to the "Vocational Training Act" of 1969, which establishes the figure of the apprenticeship contract between the apprentice and the company in which the practical training will be conducted. In this way, the law covers both the public and private spheres of VET in Germany.

This federal law defines the conditions and procedures of VET in the country, regulating the relationships between apprentices, employers, and training centres. It also establishes requirements for programmes, duration, learning objectives, curricular content, and final examinations. It also establishes the responsibilities of the parties involved: employers, apprentices, and training centres, as well as their rights and obligations (Federal Ministry of Education and Research [BMBF], 2015).

Federal law is therefore the cornerstone of the country's vocational education system, providing a clear and coherent framework for VET, and ensuring high-quality training for apprentices, and a skilled workforce for employers. According to Deissinger (2005), this is one of the most important aspects of the vocational education system especially when it is compared with other comprehensive and detailed regulatory systems for VET in the Western world.

Thus, the structure that enables the development of the VET training mission in Germany starts at secondary level and takes place in three spheres:

A. *Vocational preparation*: It lasts between one and two years and trains apprentices to become more competent and enter a specific apprenticeship training program.

B. *Vocational training in colleges or schools*: It lasts between two and three years and provides students with occupational qualifications relevant to the world of labour.

C. *Leaving secondary education*: An educational structure is offered that includes programs for employees, unemployed, vulnerable populations, and private training for adults.

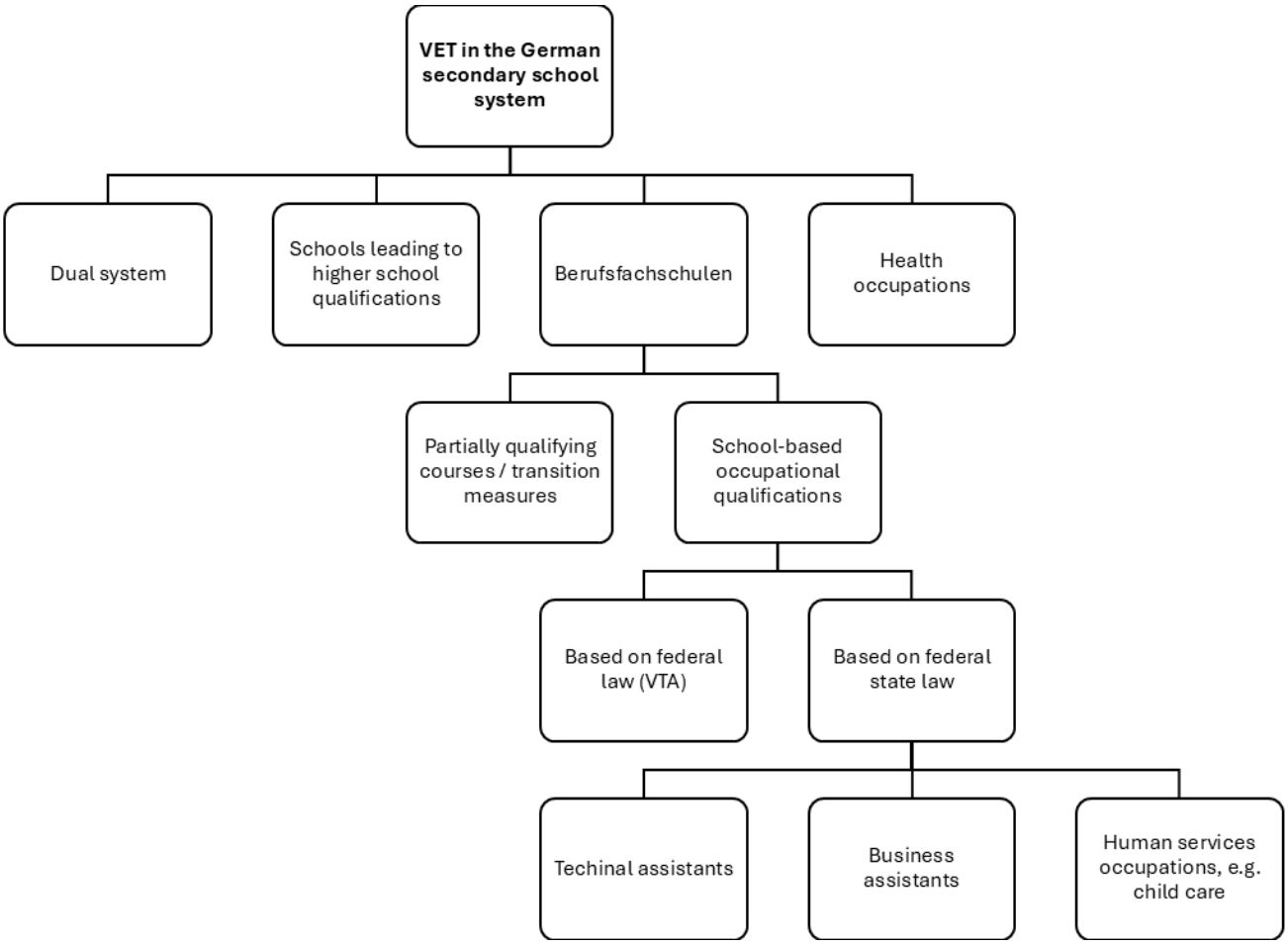
In this way, the VET system vocationally guides young Germans from school, grouping together the different institutions mentioned by Deissinger (2018) and described in Figure 2, namely:

1. Part-time vocational training schools that provide basic theoretical knowledge and general training for apprentices in the dual system.
2. Full-time schools that qualify young people for so-called "school occupations" based on federal state law and the VET Act. They represent 6.7% of apprentices entering school-based VET in Germany and a further 10.2% obtaining a hybrid qualification (HQ). While the latter represents only 2.1% of entrants into school-based VET in Germany (Federal Institute for Vocational Education and Training [BIBB], 2018).
3. "Formalised" school-based VET, leading to a nationally recognised qualification in the health and social services sector (hospital nurses, nurses for the elderly, physiotherapists) this is the school-based training and represents 81% of VET entry students in the school-based system (BIBB, 2018).
4. Full-time courses within the "transition system" which are mostly intended for vocational preparation and/or transition to general education and apprenticeship.
5. Full-time VET schools leading to educational qualifications in lower secondary education, middle secondary education, university entrance to applied sciences and university entrance qualification. These schools/courses partly provide for the academic aspirations of young people but may also lead to an apprenticeship or VET.

This is how Deissinger encompasses all the categories in three main concepts, according to type of training, employment purposes and higher education:

a. *Full-time VET in a broad sense* (Categories 2, 3 and 4): They aim to receive training through attendance and achieve a relevant qualification in the world of labour.
b. *Full-time VET in a strict sense* (Category 5): It does not involve substantial periods of practice or involvement with companies, as apprentices (who would be students) only aim for higher school qualifications.
c. *Transitional System* (Category 6): It offers young people the opportunity to further their education, targeting those who want to become apprentices, but also recent graduates, school leavers or even migrants.

Figure 2. VET Structure according to the institutional arrangement



Source: Deissinger (2018).

This comprehensive system ensures broad educational coverage, from schooling to employment, with the participation of trade unions, business organisations and chambers. This collaborative approach and the feeling of social responsibility foster the popularity of the dual system, making it a preferred option for many young people after high school (Federal Ministry of Education and Research [BMBF], 2015; CEDEFOP, 2020).

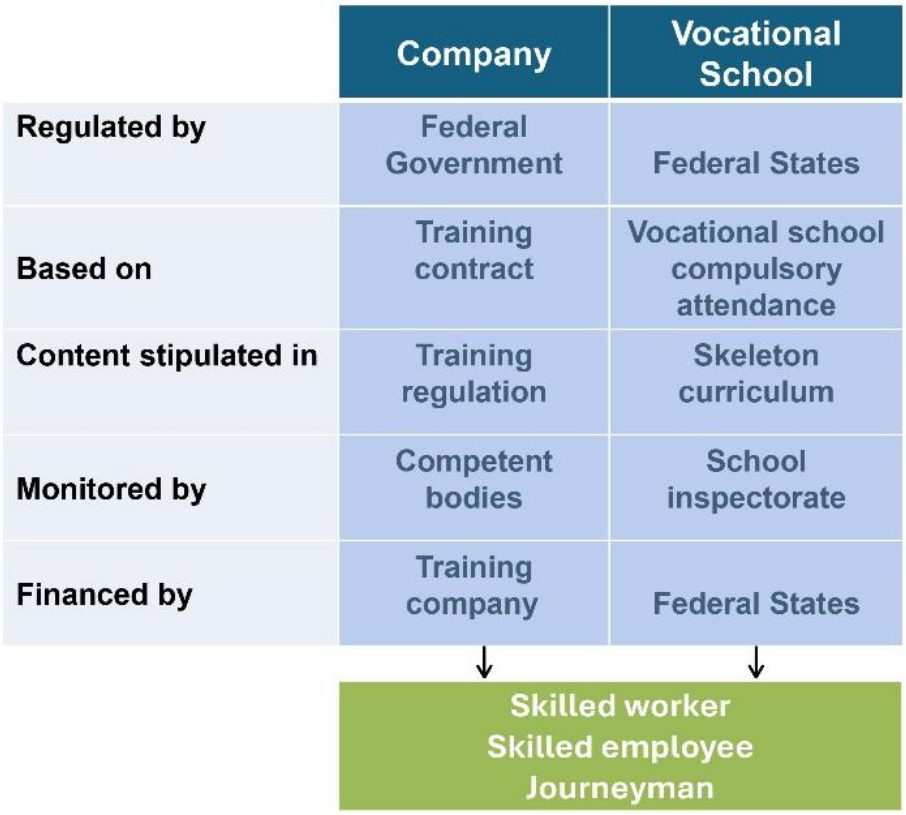
2.5. Financing and regulation of the VET system

The VET system in Germany is financed by the involvement of public and private investors, including federal and state government institutions, the Ministry of Education and the Ministry of Economics and Employment. The Federal Employment Agency and local authorities also finance it. However, most of the resources come from the private sector

represented by associations, companies, private institutions, and even individual contributions (CEDEFOP, 2020).

As for regulation, this is divided according to the dual system: the federal government controls training in the company, while regulation in vocational schools is the responsibility of the state authority (Figure 3).

Figure 3. Vocational Education and Training (VET) and the Dual System in Germany.



Source: CEDEFOP (2020, p. 25).

Public expenditure includes the costs of regulation and the provision of vocational schools, as well as the financing of training and capacity building programmes for adults and people vulnerable to unemployment or continuous VET. Meanwhile, the private sector, through the "training tax", finances the training and capacity building of its employees. In addition, there is also an indirect contribution from workers through the payment of their taxes into the general resource pool.

2.6. Challenges of German VET

The recent success of the German economy is intricately linked to its Dual Vocational Training system. This model has enabled the formation of a highly skilled workforce adapted to the needs of industry, allowing the country to maintain a competitive advantage in the global market. In addition, this model has been a key factor in economic stability, as it has allowed German companies to maintain their leadership in the production of high-quality goods and advanced technology. In other words, there is a kind of complementarity between vocational training and the country's economy.

The result of this process is an economy where the basis of its recent growth is the services sector, although the manufacturing and industrial sectors still have a strong importance. In any case, this type of macroeconomic environment is ideal for training and absorbing the workforce, which is required to have an increasingly higher level of qualification to adapt to both the new needs of industry and the growing fields of services and the digital age (Deissinger, 2018).

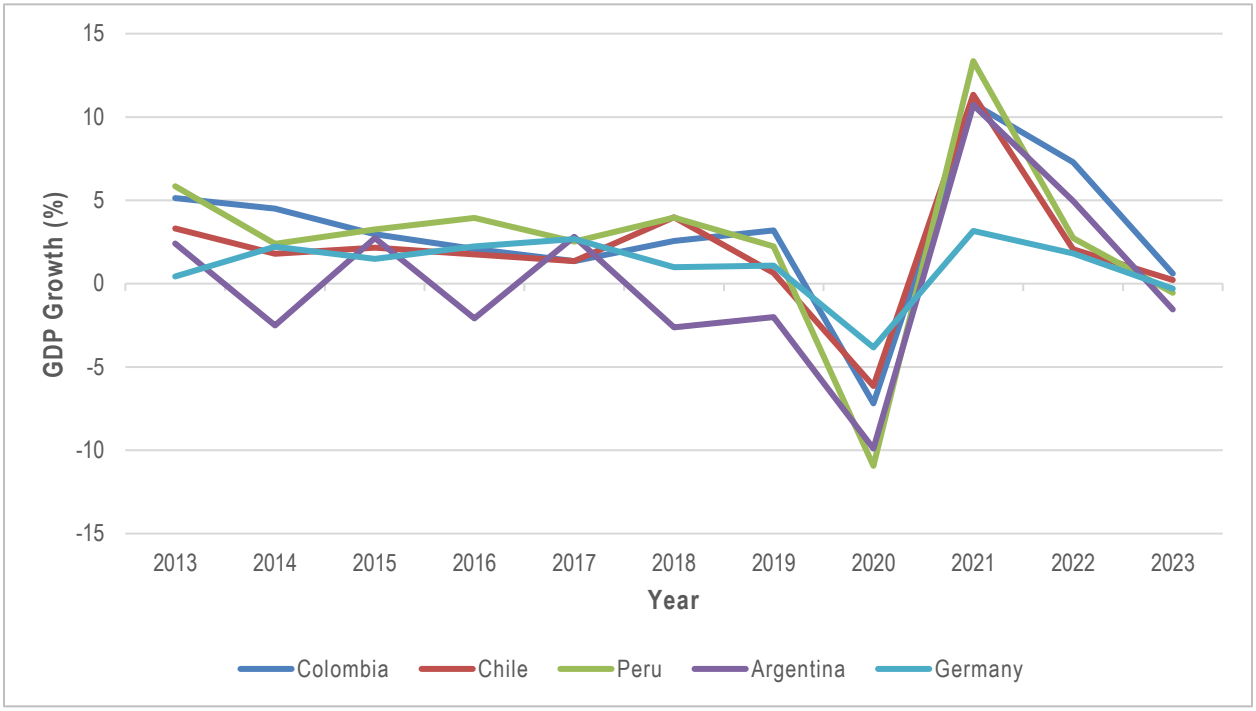
However, in recent years, the German industry has faced significant challenges due to volatility in energy markets, exacerbated by global geopolitical dynamics. Dependence on external energy sources and rising energy costs may have impacted the competitiveness of the industrial sectors targeted by VET, readjusting production, and consumption strategies. Such a context has highlighted the importance of the transition towards more sustainable energy sources, as Germany faces an increasingly complex geopolitical landscape (Engler et al., 2023).

On the other hand, the VET system in Germany can be a key element in adapting the workforce to other economic changes. Through its programs, VET has facilitated the integration of emerging technologies, such as AI, into production processes (Roppertz, 2020). In fact, AI not only has not only the potential to transform production efficiency, but also the way in which workers are trained, allowing for more personalised and adaptive training that responds to the challenges of an industry that is constantly changing. However, the main social challenge for Germany and other countries is to conciliate the adaptation of a disruptive technology as AI and the job’s creation/conservation in a world highly unequal.

3. Work and institutional trajectories in vocational education in Latin America

Latin America and the Caribbean are regions where industrialization processes did not achieve considerable progress during the protectionist period and subsequently faced severe challenges due to the erosion of their productive structures under neoliberal policies. In this context, the labour market has historically been shaped by informal labour relations and high rates of unemployment and poverty (Bértola & Ocampo, 2022).

Chart 2. Gross Domestic Product (GDP) rate, 2013-2023.



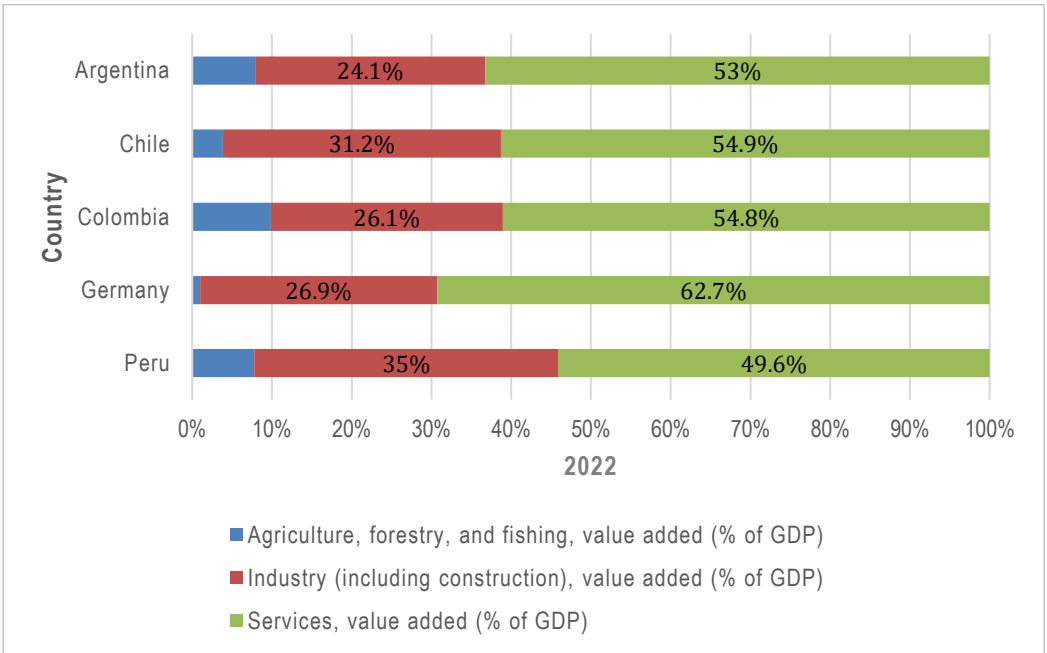
Source: Own elaboration with data from the World Bank.

The region, however, is heterogeneous in its macroeconomic characteristics and, as will be detailed below, also in the trajectories of professional training institutions. Predominantly, the region's macroeconomic structures operate on a subsistence basis; that is, the various economic sectors primarily address basic national needs without generating surpluses or high-productivity patterns. This, coupled with the region's primary-exporter profile, perpetuates inequality, unemployment, and informal labour.

In this regard, the resulting convergence in growth rates between the Latin American countries analysed in this study and the German economy has a fundamental distinction: while the decline in Latin America's growth trajectory has occurred within a

framework of extensive deindustrialization and loss of economic complexity over the past thirty years – primarily due to the increased prominence of extractive sectors – the German case is still characterised by high industrialization and the presence of high-technology services (Chat 1 and Chart 3).

Chart 3. Value added by sector (%), 2022.



Source: Own elaboration with data from the World Bank.

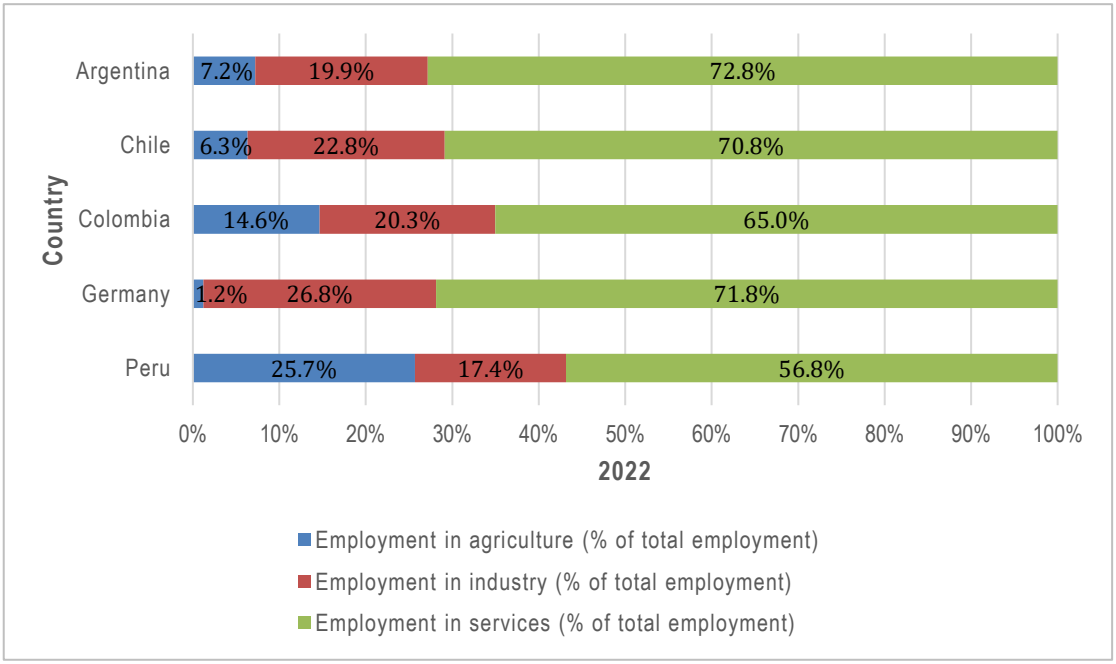
Among Latin American countries, Chile and Costa Rica report the lowest informality rates in the region – 43% and 36%, respectively, as of 2023. Nonetheless, across Latin America and the Caribbean, approximately five out of ten workers lack formal employment contracts and associated rights, such as social protection, with even worse figures among young people, where informality affects 58% (International Labour Organization [ILO], 2023).

Informality, therefore, is neither marginal nor exceptional in the region. Hence, efforts are being made to transcend the dogma surrounding this statistical category to ensure workers' rights regardless of their formal employment status. Proposals such as the "popular and community economy" aim to recognise and promote diverse forms of work across various countries in the region (Sindesena, 2021; Giraldo, 2022; Gago et al., 2023).

The popular and community economy, while present across all economic sectors, is undoubtedly predominant in the services sector. This represents a fundamental difference in both substance and form when comparing the sectoral distribution of employment

between peripheral countries and central or developed nations such as Germany. While in Germany the services sector constitutes a major share of GDP, its structure is characterised by specialised segments closely linked to the industrial sector. In contrast, in Latin America, the services sector is predominantly composed of low-productivity activities concentrated in areas such as restaurants, personal services, transportation, and others, where self-managed or informal employment is prevalent.

Chart 4. Employment rate by sector (%), 2022.



Source: World Bank (own elaboration).

Looking ahead, the region faces significant challenges in labour issues while pursuing productivity gains and value-added opportunities. Some may view these concerns as long-standing; however, the potential socioeconomic impact of automation should not be underestimated, especially given its implications for workers in formal employment relationships. According to Espíndola and Suárez (2023), the probability of replacing human labour with automated processes in the region stands at approximately 50%, with higher probabilities for skilled manual workers (0.74) and other routine jobs (0.59). The impact on incomes includes a reduction in wages ranging from 37% to 72% in occupations most affected by automation, primarily driven by artificial intelligence. The distributive effects on income, as noted in this study, reveal that non-poor and middle-class populations will experience the greatest reductions in income, potentially leading to an increase in poverty.

This poses significant challenges to institutional frameworks designed under models that assumed a high degree of human participation in productive activities. The historical divide between intellectual and manual labour is increasingly irrelevant, as the risks associated with the loss of professions and occupations blur these distinctions. Consequently, analysing the institutional frameworks supporting professional training and education for work must incorporate structural factors and contemporary challenges. Emerging categories, such as the popular and community economy – which is projected to remain the predominant form of work in the region and likely expand in developed countries – should also be considered.

3.1. Chile: a pioneering case in privatization of vocational education

3.1.1. Macroeconomic context of Chile

According to Economic Commission for Latin America and the Caribbean and World Bank databases, between 2010 and 2020, Chile experienced moderate and sustained economic growth. In the period 2010-2013, Chile grew robustly thanks to internal and external demand, which translated into GDP and GDP per capita growing at an average annual rate of 5.1% and 3.6% per year, respectively. Between 2014 and 2017, the Chile's economy slowed due to falling copper prices, reduced foreign investment and domestic demand. It is important to note that in the decade 2010-2020 Chile went through social and political changes, especially the protests of 2019 and 2020 that impacted investor confidence in the country, leading to a decrease in economic activity.

In relation with added value in Chile, the sectors that have contributed the most are mining, manufacturing, and commerce. Mining, driven by copper extraction, represented on average 10% of GDP and 34% of total added value. The manufacturing industry, with a focus on food, beverages, machinery, and chemical products, contributed 14% of GDP and 23% of added value. Commerce, mainly retail and wholesale, represented 12% of GDP and 15% of added value. Other important sectors include construction, transportation, communications, and financial services.

Regarding unemployment, it is found that between 2013 and 2019, Chile experienced fluctuations in the total and youth unemployment rates. The total unemployment rate remained relatively stable, averaging 7%, with a maximum of 7.6% in 2018 and a minimum of 6.3% in 2013. However, in 2020, the Covid-19 pandemic caused an increase to 11%, the highest level in more than a decade, although it later began to decline thanks to economic reactivation measures.

The youth unemployment rate was more volatile and generally higher, peaking at 18.9% in 2019 and a low of 15.2% in 2015. In 2020, the pandemic caused this rate to rise to 24.4%, underlining a crucial challenge for youth labour inclusion, a priority issue on the country's social and economic agenda.

On the other hand, in employment by economic sector, the services sector was the largest generator of employment in Chile, followed by industry and agriculture. In 2010, the services sector employed 66.4% of the workforce, a figure that increased to 70.9% in 2020. Meanwhile, industry and agriculture saw a decrease in their labour share, going from 22.9% to 21.9% and from 10.7% to 7.2%, respectively. During the decade, the services sector generated around 2.6 million new jobs, while industry and agriculture lost 250 thousand and 67 thousand jobs, respectively. The Chilean government has implemented various policies for job creation; in the case of industry, it has promoted policies to encourage investment and entrepreneurship, as well as job training and development programmes (Comisión Económica para América Latina y el Caribe [CEPAL], 2019).

During the decade from 2010 to 2020, unemployment in Chile showed variations according to age and educational level attained. In general, people with higher educational levels had lower unemployment rates. In 2010, while the overall unemployment rate was 8.6%, people with a university education had a rate of 5.8%, and those with technical education 7.5%. In contrast, people with secondary and basic education registered unemployment rates of 9.9% and 16.1%, respectively. Although unemployment decreased throughout the decade, the differences between educational levels remained and even deepened during the pandemic. In 2020, the overall unemployment rate was 11%, with the highest rates among people with basic (16.8%) and secondary (11.9%) education.

These data highlight that education remains crucial to accessing quality jobs and reducing unemployment. In response, the Chilean government has implemented policies to improve education and promote technical and university training, mainly through scholarship programs, educational loans, and job training, although its role is more regulatory and financing than execution.

Chile is one of the main Latin American economies, characterised by a moderate rate of economic growth and price stability. However, it presents a complex social panorama as a result of the implementation of neoliberal policies, and educational reforms have been a critical issue.

When analysed the historical context of Vocational Education in Chile, we go back to the 19th century, when technical education began to develop; in the 1920s, the first schools for training in occupations and trade were created, offering technical training

programs in areas such as mechanics, electricity and construction (Rubilar & Ulloa, 2017). In 1950, with the rise of industrialization, the National Industrial Learning Service (SENDAI) was created. At the end of the decade, in 1979 under the dictatorship of Augusto Pinochet, SENDAI merged with other institutions to give rise to the National Institute for Training and Social Education (INCES), today known as the National Training and Employment Service (SENCE), which sought to promote technical and professional training.

In the 1990s, with the return of democracy, efforts were made to strengthen technical and professional education through the creation of Technical Training Centres (CFT) and Professional Institutes (IP), which offered higher-level technical and professional training programmes. In addition, the Fund for Solidarity and Social Investment (FOSIS) was created, which aims to promote technical and professional training for low-income people (Arellano & Donoso, 2020).

3.1.2. Structure of vocational education in Chile

The main objective of Vocational Education in Chile is to develop technical and human skills and competencies necessary for the labour market through various institutions, including: Technical Training Centres (CFT) and the Professional Institute (IP) that offer programs of variable duration (from one to four years and from two to four years, respectively) and have a wide academic offer, with technical training programs in areas such as construction, electricity, mechanics, information and communication technology, tourism and hospitality, among others.

SENCE offers technical training and capacity building programs in areas such as agriculture, construction, and mining. In addition, it works in collaboration with companies and public sector organisations to offer personalised training programs adapted to the needs of the labour market (SENCE, 2021).

Finally, the National Scholarship and Educational Loan Program (PRONABEC) is an institution that offers scholarships and educational loans for low-income students. Its objective is to ensure access to technical and professional education for all people, regardless of their socioeconomic background.

When we talk about the Regulatory Framework, we refer to the Technical-Professional Education Law No. 20,910, enacted in 2016 and which establishes the guidelines for technical-professional education in Chile, including the creation of technical training institutions and programs. This law seeks to improve the quality of technical-professional education in the country, ensuring that the programs are relevant and respond to the needs of the labour market. It also establishes that technical training centres (CFT)

and Professional Institutes (IP) must be accredited to provide technical and professional training programs.

3.1.3. Financing and institutional offering for vocational education and training in Chile

As in the case of Germany, another influence of the European process in the case of Chile is the financing model. In Chile, there is a mixed scheme (public or private support), that is, the system is maintained due to the cooperation of various agents that can be defined in three diverse types of investment.

The first is public funding, which is done through the central level, which allocates resources for technical and professional training through the Ministry of Education and other public institutions, such as the National Training and Employment Service (SENCE), an entity attached to the Ministry of Labour and Social Security. Its budget is assigned annually by the government and is he second is private financing, which includes financing for companies and employers to train their workers. Finally, there is mixed financing, in which companies and the State finance the training of workers. It is in the interest of private companies to train their employees and improve the quality of the workforce, while the State guarantees the right to education.

Regarding the institutional offer, a wide variety is observed given the previously mentioned distinction (CFT, IP and SENCE).

- CFT:

a. DUOC UC was created in 1968 and belongs to the Catholic University of Chile.
b. National Institute for Professional Training INACAP founded in 1966.
c. AIEP Technical Training and Higher Education Centre, founded in 1960.

- IP:

a. AIEP Professional Institute.
b. Santo Tomas Professional Institute.

As for SENCE, it turns out to be the most similar institution to the VET system seen in the case of Germany and SENA. It has several offices throughout the country. In total, it has 15 regional offices distributed across the 16 regions of Chile.

The entity works as an entity that transfers resources to companies and organisations to conduct training processes. To access these resources, companies and organisations must present technical and professional training and development projects,

which are evaluated and approved by the entity. Once approved, companies and organisations can implement the training courses and programs, and then request the financial resources to finance them. In addition, it has its own offer of technical and professional training courses and programs, aimed at workers who wish to improve their skills and competencies in various areas. These courses and programs are taught by accredited entities and are financed by SENCE.

In Chile, vocational training has focused on providing students with specific skills that allow them to successfully join the labour market. However, the country's socio-economic context, marked by dependence on mining and inequality in access to education, has highlighted the need to reform and improve the vocational training system to make it more inclusive and better respond to the needs of all productive sectors.

In addition, the growing incorporation of advanced technologies in mining and other sectors poses an additional challenge: the training of technicians capable of handling new technologies and adapting to constant innovation, the growing demand for technological skills and the emergence of automation are transforming the Chilean labour market, which means that vocational training should not only focus on traditional skills, but also on digital skills and the ability to learn continuously.

3.1.4. Challenges of vocational education and training in Chile

The Latin American context, particularly the case of SENCE, differs significantly from Germany in terms of funding and institutional structure of vocational training. In Latin America, the privatisation of training is a notable problem. Although SENCE is a public institution, its approach is to finance demand, i.e. people pay directly for the services they want, rather than the State financing training directly.

This model limits SENCE's ability to influence economic and social development policy, as it does not create opportunities for free, quality vocational education. Instead, it focuses on funding specific training programmes for companies, which excludes many, especially young people, and poorer populations. This approach has been criticised by social and political movements that demand a more inclusive educational system, suggesting that both the State and the private sector can collaborate in training and funding, without losing sight of the fact that education must also promote citizenship, beyond work.

On the other hand, the Chilean economy has been characterised by a high dependence on the mining sector, with copper representing a sizeable portion of the country's exports. This specialization has led to uneven development in terms of technical training, as the demand for skills and knowledge has been concentrated in sectors related to

mining. This has created a gap in the diversification of the educational offer, limiting technical training to areas that do not necessarily reflect the broader needs of the Chilean labour market.

In terms of technological innovations, it is recognised that technical training must incorporate digital skills rather than focusing only on traditional skills, with this in mind Chile can address the mismatch between the technical educational offer and the real needs of the labour world to tackle inequality and dependence on specific sectors.

3.2. Peru: between “state abandonment” and private leverage

3.2.1. Macroeconomic context of Peru

When discussing the macroeconomic context of Peru, the first point to discuss is its particular path in economic growth. From 2010 to 2020, Peru experienced constant growth in its GDP, however, this growth has not been evenly distributed, with booms in 2010, 2013 and 2019 standing out (Chart 2). In terms of GDP per capita, the country went from US$ 5,167 in 2010 to US$ 6,081 in 2020, which represents an increase of 17.7%.

In terms of added value, inequality is clear, with a high concentration in sectors such as services, mining, manufacturing, construction, and agriculture, organised in a descending manner (Chart 3). Although the mining sector has been a major contributor, it is concentrated in a few companies and regions. Lima and Callao stand out for contributing between 40% and 50% of the national added value. The southern regions, such as Arequipa and Cusco, also significantly participate thanks to mining and tourism. In contrast, the regions of the jungle and the mountains, such as Loreto and Cajamarca, contribute less due to the lack of infrastructure and the scarce economic diversification (Chumacero, 2022).

Translating this into the country's unemployment rate, between 2010 and 2020, total and youth unemployment in Peru showed a general downward trend (Chart 4). In 2010, the total unemployment rate was 8.1%, falling to 6.7% in 2020. The youth unemployment rate, for people aged 15 to 24, decreased from 15.2% in 2010 to 8.5% in 2020.

This reduction is attributed to the country's economic growth, driven by foreign investment, tourism, and economic diversification. Public policies to encourage employment and job training also helped, although many jobs are informal, with 70% of jobs classified as informal in 2019.

Regarding employment by economic sector, the services sector was the main generator of employment, followed by the manufacturing sector and construction. The growth in job creation is due to the increase in tourism and services with retail and wholesale commerce.

Although these sectors are the main ones in generating employment, others such as mining and agriculture are also important in specific regions of the country.

In other hand, Peru has been immersed in processes of privatization of its economy and educational institutions, following a similar trend in the whole region. The case of Peru is similar to the Chilean case, because although there are private training institutions, and public institutions that seem incapable of achieving coverage and quality in training, especially for low-income people in various regions of the country.

Comprehensive vocational education in Peru has not focused solely on the development of skills and competencies necessary for the productive sector; it has also emphasised the training of technicians and professionals to work in government agencies. In 1920, the first technical training schools were established; in the 1960s and 1970s, with the growth of industry in Peru, the Higher Technological Institutes (IST) and the Technical Training Centres (CFT) were created, with the aim of creating the knowledge and skills necessary for the manufacturing industry (Fiszbein et al., 2018).

In the 1990s, the National System of Technical and Professional Training (SNFTP) was established, which aimed to unify and coordinate the technical and professional training offer throughout the country. With the creation of the SNFTP, new technical and professional training programs were established, such as the National Labour Training Program (PNFL). All of this sought to develop technical and soft skills and social competencies that allow adaptation to the labour market.

3.2.2. Structure and regulatory framework of vocational training in Peru

The technical education system in Peru is structured across three distinct levels, each designed to address various stages of technical and vocational training. The basic level encompasses secondary education, offering general and foundational technical training, typically through technical schools or specialised colleges. The technical-productive level provides focused technical education in fields such as mechanics, electronics, and computer science, delivered by higher technological institutes (IST), technical training centres (CFT), and vocational training programs. Lastly, the technological level offers advanced technical training in areas like engineering, architecture, and administration, facilitated by technological institutes and universities. This multi-tiered approach ensures a comprehensive

framework for developing technical skills and expertise. The structure of comprehensive vocational education in Peru is regulated by the Ministry of Education, which establishes the requirements and quality standards for institutions that offer technical and vocational training programs.

In Peru, comprehensive vocational training is regulated by various laws and regulations that establish policies and guidelines for technical and vocational education:

a. Education Law No. 28044: Defines the bases of education in the country, including technical-productive and technological training.

b. Supreme Decree No. 017-2007-ED: Regulates the organisation and operation of Public Institutes of Higher Technological Education (IESTP).

c. Legislative Decree No. 892: Regulates the National Industrial Work Training Service (SENATI), a private non-profit institution that offers technical training.

d. Ministerial Resolution No. 792-2018-MINEDU: Establishes standards for the accreditation of technical and technological programs.

e. National Competitiveness and Productivity Plan: Establishes strategies to improve technical education and its alignment with the labour market.

f. Multiannual Sectoral Strategic Plan for Education 2021-2025: Defines policies for the development of the education sector, including technical and vocational training.

Therefore, the technical education system in Peru reflects a complex and heterogeneous framework designed to address diverse needs. It encompasses a range of institutions and programs that cater to diverse levels of technical and vocational training, from foundational skills in secondary education to specialised and advanced technical training in higher institutes and universities. This diversity highlights efforts to align educational offerings with the demands of various industries and economic sectors. However, the system also reveals challenges in harmonizing standards, fostering inclusivity, and maintaining relevance to rapidly changing labour market conditions.

3.2.3. Financing and institutional offering for vocational training in Peru

In Peru, funding for vocational education is shared between the State, businesses, and students. The State, through the Ministry of Education and local governments, invests in technical and technological education. Businesses contribute through on-the-job training programs, while students pay tuition and other costs, adjusted according to their socioeconomic situation.

This financing model has been criticised for creating inequalities in access to training, especially for the poorest. Some experts propose increasing state investment in scholarships and educational loans and creating incentives for companies to participate more actively in technical training.

Programs such as PRONABEC and SENATI offer scholarships and educational loans for low-income students and collaborate with companies for on-the-job training.

Regarding the institutional offer, there are two main institutions:

- SENATI: It is one of the leading vocational education and training institutions in the country, the institution offers continuous training, short courses, and business services. One of the main advantages of SENATI is its focus on theoretical-practical training, which allows its students to acquire skills and knowledge highly valued by the industry. To this end, it has workshops and laboratories, as well as trained teachers with experience in the industrial sector. In addition, it is recognised for having an innovation and technology approach in its teaching methods to develop projects in robotics and artificial intelligence. The institution is supported by tuition fees and payment for services offered to companies, although it also receives support from the government through the Ministry of Education, making it a public-private institution.

- IESTPs: These are public institutions supervised by the Ministry of Education, which offer quality and accessible technical education throughout the country. In 2021, there were 117 IESTPs, some with locations in remote regions. Admission is through examinations and background checks, with options for scholarships and loans through programs such as PRONABEC and FONDEP. Programs last between 3 and 5 years and grant technical or technological degrees, facilitating entry into the labour market or the continuation of university studies. Despite the formalization and alignment of technical education with higher standards, this training faces low social acceptance. According to Bonfiglio (2008), quality is used as a pretext to hide a perception that favours formal education as the only means of social advancement, relegating technical education.

3.2.4. Conclusions for Peru

One of the main problems in Peru is its high rate of social inequality. This problem is reflected in the field of education, where the most privileged social sectors continue to be privileged.

However, considering the macroeconomic context in which the country operates, one of the most influential factors is its dependence on mining, which has generated large

revenues, but has also exposed the country to the volatility of international commodity prices. In addition, the concentration of mining activity in specific regions has accentuated regional inequalities and contributed to economic vulnerability, especially in times of low global demand. As for the sector, services, this is the main source of employment in the country, however, this sector has elevated levels of informality, precarious working conditions and low productivity (Chart 4).

This precariousness in working conditions is directly related to the migratory flow that the country has had, in its internal mobility it has had an effect of overloading the urban infrastructure generating urban poverty and lack of basic services that translate into a lack of social rights, perpetuating inequality and limiting better life opportunities (Matos Mar, 1990).

Giving way to technological innovations, it cannot be denied that they have transformed economies and labour markets; in Peru these innovations can have uneven effects, while certain sectors can benefit from digitalization and automation, others, especially those with low levels of education and technical skills, can be left behind, increasing inequality gaps.

3.3. Argentina: centralised regulation and union offering

3.3.1. Macroeconomic context

Argentina is one of the historically largest economies in Latin America, characterised by a high degree of urbanization and a complex macroeconomic environment. The country has faced different significant challenges, such as specialization in agricultural commodities, strong deindustrialization, high public debt, and persistent inflation. In addition, the country's economic structure has shown a strong dependence on the services sector, which has grown while industry and agriculture have decreased their share of GDP.

During the decade from 2010 to 2020, Argentina experienced economic fluctuations, with periods of recession and growth. GDP and GDP per capita showed irregular growth, affected by the recession and the economic crisis (Chart 2).

Poverty increased, reaching 42% in 2020, and the Argentine labour market also suffered during this decade, with an increase in the unemployment rate, especially among young people and less qualified workers. The employment structure showed an increasing concentration in the service sector, while employment in industry and agriculture decreased, thus modifying the country's macroeconomic structure, conditioned by vocational education and the gradual dismantling of industry (Chart 3 and Chart 4).

In short, Argentina has faced a decade of economic challenges, with high levels of poverty, inequality and unemployment, aggravating the crisis economic and the pandemic, however, the vocational education system has played a crucial role in mitigating some of the negative effects of these crises, such as preparing workers to face the changing labour market, through training trying to rebuild or strengthen the diversity of the economy, although vocational education continues to face important challenges, such as underfunding and the need to update to respond to the new demands of the labour market.

3.3.2. Historical background of vocational education institutions

Vocational education in Argentina dates to the second half of the 19th century, when the economy began to undergo transformations towards productive structures related to industry and mass production. This change generated a considerable increase in the demand for workers trained in technical and professional areas (Sladogna, 2018). Given the robust industrialization process conducted in Argentina, the training and formation of the workforce in the country was required from early on.

The history of vocational training in Argentina highlights the significant role that labour unions have played in the development and implementation of professional education systems. Since the colonial era, various sectors, such as tailoring and goldsmithing, began efforts to regulate and institutionalize vocational training. Over the centuries, unions became instrumental in advocating for the transfer of knowledge and skills, particularly during critical economic transitions, such as the industrialization process in the mid-20th century. Through the creation of training centres and active participation in policymaking, unions addressed both the demand for skilled labour and the need to enhance worker rights and opportunities (Sladogna, 2018).

In 1885, the first vocational education centre in Argentina was founded: the Buenos Aires School of Arts and Commerce. The institution's main objective was to train young people in technical and commerce areas, providing them with skills to face the challenges of a growing industrial environment.

Over time, the focus on vocational education was consolidated, and the National Institute of Technological Education (INET) was created in 1944. This organisation promoted technical and professional education throughout the country, which led to the creation of specialised technical schools in areas such as mechanics, electricity, and construction with a high participation of unions of workers.

In the 1960s, the Argentine government implemented the Human Resources Training Plan for Industry (FRI), whose objective was to train the workforce in specific areas linked to industry, strengthening the country's industrial development.

In 1995, the National Council of Education, Work and Production (CNETP) was created to improve coordination between the educational and productive sectors, ensuring that vocational education would be aligned with the needs of the Argentine labour market.

Vocational education in Argentina is a learning process designed to provide apprentices with skills and knowledge in technical and occupational areas, so that they can perform effectively and efficiently in the labour market.

In Argentina, the responsibility for comprehensive vocational and training lies with the Ministry of Education, which offers programmes at various educational levels, from secondary education to higher education. In addition, there are institutions specialised in this area, such as technical schools, higher technical training institutes and vocational and training centres (García de Fanelli, 2006). However, in the processes of training or qualifying operational workers in various industries, the role of labour unions stands out as organizations that safeguard vocational training. To some extent, this represents a delegated service entrusted to an organization that, in most cases, is not inherently a state entity.

The vocational education begins in technical colleges, which provide secondary education geared toward technical and practical training in various areas. These programs are designed to prepare students for the world of labour, equipping them with skills and knowledge in technical and professional fields that are in high demand in the Argentine labour market.

3.3.3. Regulatory framework for vocational education in Argentina

One of the main programs highlighted by INET is the National Program for Continuing Education, which aims to update and improve the skills and abilities of workers in their work areas. This program offers continuing education and training courses through different modalities, including distance education and face-to-face training. According to the National Directorate of Continuing Education of INET, these initiatives seek to ensure that Argentine workers stay up to date with the advances and demands of their respective work fields.

In addition, INET has promoted the creation of Vocational Education Centres (CFP – Centros de Formación Profesional), educational institutions dedicated to providing technical and professional training to young people and adults in various work areas. CFPs represent a crucial tool for the economic and social development of Argentina, since they

allow the formation of a highly qualified workforce, capable of contributing to the growth and development of different productive sectors of the country. In addition, CFPs offer training and employment opportunities to low-income people and people in vulnerable situations, thus contributing to reducing poverty and social exclusion.

However, CFPs in Argentina face several challenges, especially regarding their funding and their ability to offer high-quality training that meets the needs of the labour market. Another significant challenge is the need to improve the quality of the training they offer. According to a report by the National Council of Education and Work (CONET), CFPs must adapt their curricula to the current demands of the labour market to ensure that their graduates are truly prepared to face the challenges of the modern work environment.

3.3.4. Conclusions from the Argentine case

The country has suffered serious economic crises that have slowed down its economy in the last decade, macroeconomic vulnerability, and the effects of the Covid-19 pandemic. Added to these factors, inequality rates, poverty and exclusion of the popular sectors have increased. Thanks to the public nature of the institutions, learning costs have been financed, which translates into a reduction of the negative effects of the economic crisis. It thus acts as a productive but also social policy.

Despite such a positive effect, vocational education in Argentina is not free of challenges, since the system is underfunded and there are challenges in updating training to meet new demands of the world of labour and institutional transformations lead by renewed and reinforced economic policies founded in libertarianism.

Similarly, the historical involvement of labour unions in providing vocational training to workers in specific economic sectors represents both a strength and a challenge. On one hand, it reinforces the advocacy for labour rights while maintaining quality and relevance in training. On the other hand, it creates a barrier to access for the majority of the working class, including those in both the formal and informal sectors of the economy. Furthermore, the institutionalization of factory-based training through unions, coupled with structural transformations in production systems, also jeopardizes the very existence of this right.

3.4. Colombia: SENA, a survivor of neoliberal reforms

3.4.1. Macroeconomic situation

Colombia is one of the largest economies in Latin America, but it is grappling with significant economic and social problems, especially in terms of inequality (Chart 1), resulting in one of the highest Gini indexes in the world. Indeed, formal education and vocational education and training can promote productive transformations and tackle poverty.

Colombia's services sector is a major contributor to its economic structure, accounting for around 55% of GDP in 2022 (Chart 3). The industrial sector's share has fallen to 30 percent and agriculture has maintained its 7-point increase. The services sector's representation is a good sign of a modernised economy, but it also creates problems in terms of productivity, job quality, and diversification.

Unemployment peaked at 15.9% in 2020 due to the pandemic, with youth unemployment being particularly high at 27.1%. Women are more likely to be unemployed than men at all educational levels. The data reflects the structural problems of the labour market and the need for more efficient policies to generate employment and promote gender equality (Chart 4).

And dependence on extractive industries creates long-term environmental and sustainability problems. Diversifying the economy towards more sustainable and high value-added sectors is increasingly common. And Colombia's status as a developing nation presents a particular challenge when it comes to adapting to rapid technological advances. The digital divide and lack of technology in some areas can worsen inequality. Automation and digitalization further disrupt the labour market, especially for low-skilled workers.

Colombia is a macroeconomic continuum with unpredictable economic growth, significant inequality, and dependence on extractive industries. The high representation of the services sector and the need to diversify the economy and address social rights gaps are crucial challenges that will persist in the future. Colombia will be a better country in the coming decades, but only adapting technological advances and being social and environmentally friendly.

3.4.2. Historical context of vocational education in Colombia

Vocational education in Colombia has been a fundamental pillar for the country's development, especially since the mid-twentieth century with the creation of the National Learning Service (SENA). In a context of drive towards industrialization, SENA played a

crucial role in meeting the training needs of the productive sector (Misas Arango et al., 1994; F. Giraldo & Pemberthy, 2015).

Before the creation of SENA in 1939, the Central Technical Institute (ITC) was established, a pioneering educational institution in the technical and technological training of young Colombians. The ITC focused on key areas such as mechanics, electronics, and construction, setting a precedent in technical education in Colombia.

In 1957, the creation of SENA marked a milestone in the technical and technological training of Colombian workers. This institution, created by a cession of social salary of Colombian workers, has been recognised at a regional level for its theoretical-practical approach, integrating technical competencies with social and personal skills, making it one of the main vocational education institutions in the country (Misas Arango et al., 1994; Sindesena, 2021).

The 1990s brought with them the implementation of Law 115 of 1994, which established the legal framework for education in Colombia. This law, established through the efforts of the popular movement and the institution's workers who mobilised against its privatization, enabled the structuring of a regulatory framework to ensure the constitutional right to comprehensive vocational training.

A key transformation in vocational education in Colombia has been the emphasis on business creation and not just on training workers. Under the initial leadership of the Ministry of National Education since 2002, an entrepreneurship policy combined with the goals of formal education, as seen in the case of the technological level, this has undermined the mission of the institution by imposing academic requirements on workers seeking to qualify or update their skills in trades and occupations. In fact, SENA has developed technical and technological training programs with a strong focus on entrepreneurship in innovation and entrepreneurship (Mora, 2016; Angarita, 2017).

3.4.3. Structure of vocational education in Colombia

The National Learning Service (SENA), established in 1957 and operating under the Ministry of Labour, stands as the most prominent institution providing vocational training at technical and technological levels. Although it is not the sole public institution in this field, technical institutes and private entities also offer vocational training, often as a paid service. With more than 1,200 branches across the country and nearly 400 training programs, SENA serves approximately 9 million students in various areas, from information technology to gastronomy and tourism. Its offering includes programs for vulnerable populations and victims of the armed conflict, reinforcing its social role.

The institution focuses on competency-based learning, which means that students acquire skills for the performance of an occupation. SENA programs are designed in a theoretical-practical way, through professional internships, workshops, training environments and team projects, which leads to comprehensive training in values, professional ethics, and social responsibility.

To provide a broad educational offer adapted to the needs, vocational education in Colombia is structured in a tripartite manner (workers, businessmen, state). However, this intended harmony is limited by the dynamics of the economic model, the effects on the mission of the entity and the neoliberal reforms that have affected its method of financing (Sindesena, 2021).

Although Agreement 008 of 1997 properly defines the guidelines of vocational education, the evidence of SENA coverage data is more in line with formal education coverage data. This neglects both short- and long-cycle courses in occupational training to make way for inflated figures typical of formal education such as "technologist in" (Mora, 2016). Regarding technological education, this focuses on the qualification of technological professionals in different areas, with a duration of between two and three years, which ends in a permanent flow of new enrolees in private high education institutions with which SENA has established homologation agreements and who end up validating between four and five semesters, that is, half of the career, especially in administrative areas.

3.4.4. Regulatory framework for vocational education in Colombia

Colombia's vocational education and training system is shaped by a legal and institutional framework. Education is recognised as a fundamental right, with comprehensive training as its cornerstone, guided by policies that emphasize inclusivity and labour market relevance. Public institutions like SENA play a pivotal role, maintaining their public and free nature through legal protections. Complementary legislation and regulations have further refined the vocational education landscape, setting standards for technical and technological programs, certifying labour competencies, and addressing evolving challenges such as those posed by the Covid-19 pandemic. This complex legal framework includes several key laws and decrees:

1. Law 115 of 1994 (General Education Law) established the general framework for education in Colombia, defining education as a fundamental right and emphasizing comprehensive training.
2. SENA, however, is governed by Law 119 of 1994, which arose from a citizen initiative to defend its public nature, the free nature of training and its status as a right.

3. Law 749 of 2002 regulated the creation and operation of educational institutions for work and human development, establishing requirements for technical and technological programs.
4. Decree 4904 of 2009 regulates the certification of labour competencies, seeking to guarantee the quality of vocational education and promote labour inclusion.
5. Additionally, the Ministry of Education has issued complementary resolutions and guidelines, such as Resolution 2343 of 1996 and Ministerial Directive 01 of 2020, the latter adapting the educational offer to the context of the Covid-19 pandemic.

This legal framework reflects efforts to regulate vocational education in Colombia, covering everything from general education to specific aspects of technical and technological training, and adapting to the changing circumstances of the country.

3.4.5. Financing of vocational education in Colombia

The financing of vocational education and training in Colombia is characterised by a mixed system that includes both public and private institutions:

1. Public institutions receive funding from the government, while private institutions depend on tuition and their own income.

2. The Ministry of National Education allocates resources through the National Financing Fund for Higher Education (Solidarity Fund) for technical and technological education in public institutions.

SENA represents a unique case in Colombia's vocational training system, particularly in its financing structure. Until 2012, its funding came from a 2% contribution from workers' salaries. However, the tax reform introduced by Law 1607 in 2012 eliminated parafiscal contributions for private sector workers earning less than ten minimum monthly wages. This reform, driven by neoliberal principles, argued that such parafiscal charges were non-wage costs contributing to unemployment and informality. Consequently, SENA's funding shifted to rely on contributions from the central government, rendering it vulnerable to economic and political fluctuations. This shift has had significant repercussions, including increased dependence on direct taxation and the political will of the government in power, repeated non-compliance with legally mandated budgetary guarantees, and persistent criticism of earmarked income for being perceived as "budgetary rigidities."

This change in SENA's financing model illustrates a transition towards policies more aligned with neoliberal principles, which has generated debates about the stability and financial autonomy of this important vocational education and training institution in Colombia.

3.4.6. Conclusions from the Colombian case

Colombia is not a country that is immune to the macroeconomic problems facing Latin America. The processes of deindustrialization, the relative inertia of inequality, poverty and other socioeconomic factors are characteristic of this country. In this historical and conjunctural contexts the vocational education and training, and particularly its main institution (SENA) plays a pivotal role in aspects such as the recognition of labour and the promotion of popular and community economies.

Similarly, privatization processes in other countries, or the loss of mission focus without the sale of assets, as seen in the case of SENA, instead of addressing structural problems, often exacerbate social and distributive conflicts as well as weaken the productive structure.

In the Colombian case, the reality is even more challenging, since the economic and social problems are compounded by the unresolved armed conflict in the country, which since the mid-twentieth century has expelled rural workers from all over the country to urban centres, leaving the population vulnerable in either space and without guarantees of decent employment, since the countryside is devastated not only by the effects of the war but also by the lack of a productive approach; and in the cities there is no productive apparatus capable of absorbing labour.

Therefore, it is no coincidence that in recent years SENA has been revising its methodologies for engaging with rural and popular communities. This shift is not only a response to the social unrest that erupted in 2021 but also reflects the pressing need to recognize that the unique dynamics of "Colombian-style" capitalism demand differentiated approaches. These approaches must promote and support community and popular forms of organization that ensure the continuity of the economic system while addressing the persistent challenges of violence and inequality.

This underscores the importance of a public vocational education institution like SENA, as the effective fulfilment of its mission could play a crucial role in reducing inequality and rebuilding or establishing a robust productive framework.

Conclusions and final reflections

First, it is important to clarify that this exercise of comparison does not seek to have Latin American countries imitate the development path of developed countries, since it is understood that the historical and geopolitical conditions define the current situation of the countries compared. However, is important to denote the way in which the institutional arrangements in this region have been inspired in a particular reference as the German case.

In other hand, the macroeconomic environment in which vocational education is carried out defined its own structure and offer, because the world of labour is intrinsically dependent of the macroeconomic structure of the countries and at the same time ideally vocational education should be able to influence the construction of the economic structure, determining the training of the workforce, planning the economic structure through vocational education.

However, both peripheral countries, such as those considered in this analysis of Latin America, and Germany, as a developed nation, are currently facing similar challenges due to the influence of technological change and geopolitical realignments. In this context, the institutional framework, and the mechanisms for ensuring vocational training will be decisive in shaping the dynamics of labour, the protection of wage rights, and the broader trajectory of capitalism itself. Only the seemingly detached rationality of our era will reveal the future prospects of institutional arrangements between labour and vocational training.

At this point in time, and considering the inherent limitations of the sample and the scope of this study, some partial conclusions can be drawn:

- Even including the German case, is highlighted that all countries analysed have experienced deindustrialisation and a decline in the agriculture, with the service sector absorbing these declines. However, there is a key difference: in Germany, the service sector is highly productive and protects labour rights, while in Latin America it is characterised by informal, precarious but pivotal jobs. These informal jobs have often been stigmatised and used to justify neoliberal reforms. However, from another perspective, they embody the diverse range of occupations and trades that define the popular and community economy intrinsic to the patterns of capitalist accumulation in Latin America and the Caribbean.

- In Latin America, given the lack of formal employment opportunities, popular and community economies were born as an alternative for subsistence, hence the need to recognize and strengthen popular economies through vocational education to improve the value of work and promote social inclusion. However, the reformed (un)specialised institutions

for vocational education have relegated this type of work, focusing its efforts and resources in the declining formal sectors.

- Comprehensive vocational education and training is a key factor for both, productive development, and social advancement. In Germany, the productive sector values this training and it has been used to address social challenges such as migration. In Latin America, the redefinition and strengthening of vocational education is crucial to address social needs, not because of current circumstances, but because of a history marked by inequality, poverty, and the lack of state effectiveness.

- In Argentina and Colombia, training citizens from less privileged sectors to enter the labour market helps to reduce inequality and poverty. For this to work, vocational education must be disconnected from the commercial circuit of education, maintaining relations and dialogues with the productive sector to articulate it with the market, but keeping a distance from the commercialisation of education, understanding vocational education and training as the right of workers and the citizens.

- In Latin America, vocational education and training has a transformative potential both in social and in the macroeconomic structure, through planning labour demand, training the workforce and guiding the development of the economic structure and its sectors, which is why it is crucial to increase and ensure investment in this type of education, since it is key to improving productivity, competitiveness and well-being in different countries, acting not only as a social policy, but also as a driver of economic transformation.

References

Arellano, M., & Donoso, G. (2020). Formación técnico profesional en Chile: aportes a la transformación de las personas y al desarrollo del país. En C. Adlerstein y otros, *Horizontes y propuestas para transformar el sistema educativo chileno* (pp. 336-359). Ediciones Biblioteca del Congreso Nacional de Chile.

Angarita, L. A. (2017). *La formación profesional integral en Colombia: una visión prospectiva*. Ecoe Ediciones.

Bértola, L., & Ocampo, J. A. (2022). La economía latinoamericana durante las primeras décadas del siglo XXI. *El Trimestre Económico*, *89*(353), 39–71. https://doi.org/10.20430/ete.v89i353.1425

Bonfiglio, G. (2008). ¿Qué hay detrás de la baja aceptación de la formación técnica en el Perú? *Debates en Sociología*, (33), 77–94. https://doi.org/10.18800/debatesensociologia.200801.004

Chumacero, E. (2022). *Desigualdad de ingresos y desarrollo humano en las regiones del Perú: un análisis de datos de panel 2004-2019*. (Monografía, Profesional de Ingeniería Económica), Universidad Señor de Sipán, Perú. https://repositorio.uss.edu.pe/handle/20.500.12802/9513

Comisión Económica para América Latina y el Caribe (CEPAL) (2019). *Panorama social de América Latina 2018*. CEPAL. https://www.cepal.org/es/publicaciones/44395-panorama-social-america-latina-2018

Deissinger, T. (2018). Problems and challenges of full-time and school-based VET in Germany. In J. Gallacher & F. Reeve (Eds.), *New frontiers for college education* (pp. 148-164). Routledge.

Engler, M., Nowicka, M., Bouché, A., & Christinck, L. (2023). *Germany country report*. European Comission. https://economy-finance.ec.europa.eu/system/files/2023-06/ip229_en.pdf

Espíndola, E., & Suárez, J. I. (2023). Automatización del trabajo y desafíos para la inclusión laboral en América Latina: estimaciones de riesgo mediante aprendizaje automático ajustadas a la región. [Políticas Sociales, n. 245], Comisión Económica para América Latina y el Caribe (CEPAL). https://www.cepal.org/es/publicaciones/68574-automatizacion-trabajo-desafios-la-inclusion-laboral-america-latina-estimaciones

European Centre for the Development of Vocational Education (CEDEFOP) (2020). *Vocational education and training in Germany: Short description*. Publications Office. https://www.cedefop.europa.eu/en/publications/4184

Federal Institute for Vocational Education and Training (BIBB) (2018). *VET data report Germany 2016/2017*. Facts and analyses to accompany the Federal Government Report on Vocational Education and Training: selected findings. https://www.bibb.de/dienst/publikationen/en/9550

Federal Ministry of Education and Research - BMBF (2015). *Report on vocational and education training 2015*. Division of Basic Policy Issues of Initial and Continuing Vocational Training. https://www.bmbf.de/SharedDocs/Publikationen/de/bmbf/FS/31083_Berufsbildungsbericht_2015_en.pdf?__blob=publicationFile&v=4

Fiszbein, A., Oviedo, M., & Stanton, S. (2018). *Educación técnica y formación profesional en América Latina y el Caribe: desafíos y oportunidades*. CAF (Banco de Desarrollo de América Latina) & El Diálogo. https://scioteca.caf.com/handle/123456789/1345

Fürstenau, B., Pilz, M., & Gonon, P. (2014). The dual system of vocational education and training in Germany: what can be learnt about education for (other) professions. In S. Billett, C. Harteis, & H. Gruber (Eds.), *International handbook of research in professional and practice-based learning* (Vol. 1, pp. 427-460). Springer.

Gago, V., Cielo, C., & Tassi, N. (Comps.) (2023). *Economías populares. Una cartografía crítica latinoamericana*. Consejo Latinoamericano de Ciencias Sociales – CLACSO. https://libreria.clacso.org/publicacion.php?p=2844&c=62

García de Fanelli, A. M. (Ed.) (2006). *Formación profesional en Argentina: balance y perspectivas*. Centro de Estudios de la Educación Argentina, Universidad de Buenos Aires.

Giraldo, C. (2022). *Lo popular: dimensiones económicas, sociales y políticas*. Consejo Latinoamericano de Ciencias Sociales – CLACSO. https://www.clacso.org/lo-popular-dimensiones-economicas-sociales-y-politicas/

Giraldo, F., & Pemberthy, L. S. (2015). La educación técnica y tecnológica en Colombia. Universidad Nacional de Colombia.

International Labour Organization (ILO) (2023). *2023 Labour overview of Latin America and the Caribeean*. Executive summary. https://www.ilo.org/publications/2023-labour-overview-latin-america-and-caribbean-executive-summary

Matos Mar, J. (1990). Las migraciones campesinas y el proceso de urbanización en el Perú. Centro de Recursos para la Educación, la Cultura y el Desarrollo; UNESCO. https://centroderecursos.cultura.pe/es/registrobibliografico/las-migraciones-campesinas-y-el-proceso-de-urbanizaci%C3%B3n-en-el-per%C3%BA

Misas Arango, G. et al. (1994). *El SENA del siglo XXI: elementos para su reestructuración* (Tomo 1). Servicio Nacional de Aprendizaje (SENA). https://repositorio.sena.edu.co/handle/11404/1930

Mora, A. F. (2016). *La seudorrevolución educativa: desigualdades, capitalismo y control en la educación superior en Colombia*. Editorial Pontificia Universidad Javeriana.

Programa Nacional de Becas y Crédito Educativo (PRONABEC). https://www.pronabec.gob.pe

Roppertz, S. (2020). Artificial intelligence and vocational education and training: perspective of German VET teachers. [Conference Proceedings], European Distance and E-Learning Network (EDEN) (No. 2, pp. 207-216). https://doi.org/10.38069/edenconf-2020-rw0023

Rubilar, A., & Ulloa, P. (2017). *Educación superior técnico profesional en Chile*. (Tesis, Grado de Licenciada en Gobierno y Gestión Pública), Universidad Academia de Humanismo Cristiano, Chile. https://bibliotecadigital.academia.cl/items/2077cc8e-7ff9-4a59-8938-f90d42532c07

Sennett, R. (2009). *El artesano*. Editorial Anagrama.

Sindicato de Empleados Públicos del SENA (Sindesena). (2021). Tejiendo una propuesta SENA para el fortalecimiento de la formación profesional integral. https://www.sindesena.org/descarga/tejiendo-una-propuesta-sena-para-el-fortalecimiento-de-la-formacion-profesional-integral/

Sladogna, M. (Comp.) (2018). *Sindicatos y formación profesional en Argentina: antecedentes y desafíos*. OIT/Cinterfor; Confederación General del Trabajo de la República Argentina; Aulas y Andamios Editores. https://www.oitcinterfor.org/publicaciones/sindicatos_fp_arg

Received on September 1, 2024.

Approved on October 20, 2024.