

From global trends to national specificities in Vocational Education and Training: empirical and methodologic al contributions from a Latin-American case study

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Abstract

Secondary Vocational Education and Training has undergone significant transformation in recent decades. Though de-specialisation and differentiation are the main global trends underlying educational reforms, it has been identified that they have had limited impact in Latin American countries. This is the case of Argentina. In recent decades, secondary VET experienced two rounds of reforms. The first one, since the early 1990s, changed academic structure, curricular design and educational planning and management in line with global trends. After the mid-2000s, a second wave of reforms emerged, seemingly reversing the earlier changes and supporting the idea of two opposite phases in educational policy direction. How thoroughly was the first cycle of reforms implemented? Did the second cycle overturn the first one? Why did this second group of policies appear to contradict global trends? Which were the driving forces behind these transformations? The article has a twofold objective. First, to answer these questions and bring insights into VET characteristics of a country with a shared specificity in the Latin American region. Second, it seeks to contribute to educational policy studies based on the critique of political economy analytical approach and methodology. This perspective understands educational changes as a product of material transformations in national fragments of the global capital accumulation

process and class conflict and state regulation as necessary political forms for its realisation.

Keywords: *Vocational Education and Training, Secondary education reforms, Despecialisation, Differentiation, Critique of Political Economy*

Introduction

Secondary school and Secondary Vocational and Technical Education (VET) have been deeply transformed in the last decades. Specialised literature has recognised two main global trends.

On one hand, there has been a despecialisation of secondary education, which includes a decrease in vocational enrolment, the generalisation and standardisation of lower-secondary school curriculum delaying VET to upper-secondary and an increase in general content in VET programs (Briseid and Caillods, 2004; Benavot, 2006; Kamens, D. y Benavot, 2007). This process has also involved the implementation of competence-based curricular designs and a significant integration of theoretical and practical content (Brockmann, Clarke and Winch, 2008; Cedefop, 2010), as well as a gradual elimination of barriers for VET track students to continue to higher studies (Benavot, 2006; Unesco-Unevoc, 2006). The results for initial VET after almost 5 decades of changes are fewer and broader qualifications with strengthened general education components and transversal skills and competences (Maclean and Pavlovla, 2013; Cedefop, 2023).

On the other hand, educational differentiation has been intensified through various institutional mechanisms. The diversification of VET provision has advanced by granting greater autonomy in curriculum design and delivery. Additionally, the individualisation and flexibilisation of educational pathways

are being promoted through modular curriculum designs, which increase the opportunities for individuals to choose their own tracks as well as by new methods for validating non-formal learning (Green and Wolf, Alison and Leney, 1999; Benavot, 2006; Maclean and Pavlovla, 2013; Cedefop, 2023).

It has been acknowledged that in Latin American countries, these trends of change, particularly the first ones, have had limited impact. In several cases, reforms intended to eliminate VET from secondary education were unsuccessful. Instead, they led to modifications in the academic structure and content of vocational secondary education without substantially altering its specificity (Sevilla and Dutra, 2016).

Argentina is one such country. In recent decades, secondary VET experienced two rounds of reforms. The first cycle, which started in the early 1990s, introduced changes to the academic structure, specialisations, and curricula, as well as funding mechanisms, curriculum planning, and educational management. These reforms tended to despecialise and differentiate the training profile of technicians in line with the global trends outlined. After mid-2000s, a second wave of reforms emerged, seemingly reversing earlier changes, and supporting the idea of two contrasting phases in educational policy direction. How thoroughly was the first cycle of reforms implemented? Did the second cycle overturn the first one? Why does this second group of policies appear to contradict global trends? This article aims to answer these questions by presenting the results of the changes in secondary VET education in Argentina along these two decades.

We will also explore the driving forces behind these transformations. Specialised literature on Argentinian reforms tends to focus either on the evolving skill requirements driven by changes in labour processes and market

dynamics or on political drivers, often linked to prevailing state models. Even when both aspects are considered, authors suggest an external relationship among economics, politics, and education as relatively autonomous social spheres, which we find problematic. Another challenge appears when it comes to analysing the relation between national and global levels. The international dimension in these approaches often appears either as a backdrop for national events or as an external influence. Bringing unity back to analysis is the other major objective of this article.

Hence, we will adopt an approach and methodology based on the critique of political economy. This means that we consider productive changes and labour force training demands as the material content of educational transformations, which manifest themselves through policies or reforms, although not in a direct way but mediated by political actions of different social personifications. That is why the national analysis will include a local case study. We will examine the productive and labour transformations in the steel and metal-mechanic sector in the city of San Nicolás (Buenos Aires province, Argentina), as well as the role played by the business sectors and VET schools over educational reforms. Additionally, our perspective entails a global point of view. We understand educational transformations in Argentina as a manifestation of changing labour force training needs, determined by the role of the country in the international division of labour.

In sum, this paper seeks to shed light on the extent of global VET trends in Argentina, as a country that shares common features with others in the region, but also to present an analytical approach and method for national educational policy analysis. To achieve this, we will first outline the starting point of our research. We will delineate the initial concern regarding the pendular movement of national VET reforms, briefly discuss the more commonly accepted

explanations as well as their limitations and propose an alternative approach. Secondly, we will present the ultimate definition of our research problem and outline the key features of our method of study. Finally, we will present the research results at the global, national, and local levels, and summarise the main findings and conclusions.

The research point of departure

Shifting Trends in Argentinian VET Reforms

Vocational education in Argentina has been provided through various post-primary and secondary programs since the late 19th century, albeit with limited enrolment. In 1940, it began to expand in tandem with the growth of domestic industry, leading to the development of two parallel tracks: one inside secondary school leading to further studies, and another outside the educational system focusing on job placement (Weimberg, 1969; Tedesco, 1977).

However, both pathways progressively converged and in 1960 a single secondary VET program was consolidated (Weimberg, 1969; Wiñar, 1981). These National Technical Education Schools (ENETs) offered full horizontal articulation with the rest of secondary programmes¹ and vertical integration with every institution and degree programmes of higher education. Their curricula were oriented towards various industrial and construction specialties, lasted one more year than non-VET tracks and doubled its time load. The curriculum design comprised a set of theoretical subjects, based on general content in common with other secondary programmes and on technical content specific of VET, as well as school-based labour practice at workshops focused on mastering manual work techniques. Finally, it is also noteworthy that VET was characterised by a high degree of centralisation in funding, curriculum planning, and educational management by the national government, which tended to promote uniformity in training across the country (Hirsch, 2022).

All these characteristics remained essentially unchanged until the last decade of the 20th century, when academic structure, curricular design and educational financing and governance were deeply transformed. Two main cycles of VET reforms with an apparent opposite direction can be identified.

During the first one, starting at the beginning of the 1990s, compulsory basic education was extended subsuming 2 years of the former low secondary. This shortened secondary education, and the specialisation was delayed (Figure 1). At the same time, curricular reforms increased the general profile of secondary school eliminating the differentiation into specific labour sectors or occupations. As a result, secondary school turned into Polymodal education, removed VET modality, and made it an optional Vocational Technical Pathways (known as TPP in Spanish) complementary to the secondary certificate. Traditional orientations in the field of industry and construction were still offered as TPPs, but new ones in the field of services were created.²

Additionally, regulations introduced modularised and competence-based approaches in VET programmes. The new curricular philosophy was based on modules (as units of learning outcomes) that would enable the unification of theoretical and practical content formerly separated between academic subjects and workshop practices. At the same time, they would increase flexibility and diversity in training profiles, providing learners with greater degree of choice and individualisation in designing their own VET pathway.³

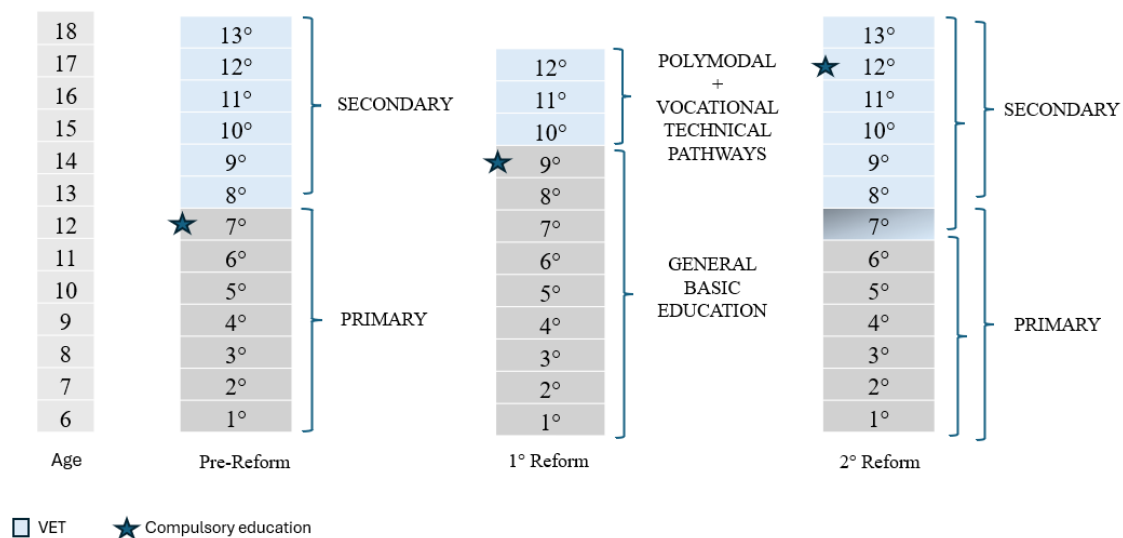
The third key aspect of the reform was the decentralisation of educational financing along with curricular and administrative definitions from the national to the sub-national level (provinces), seeking for regional diversification as well as greater autonomy for providers in terms of curriculum design and delivery.⁴

During the second cycle of reforms, initiated at mid-2000s, the extension of compulsory schooling continued till the end of secondary school, but changes in the academic structure were reversed. General basic education was reduced, and secondary education was extended by 2/3 more years (Figure 1). The Polymodal character was abandoned, and VET was reintroduced as an option among others leading to the secondary certificate (1/2 years longer track depending on the jurisdictional choice), while the number of VET industrial pathways were multiplied.⁵

Furthermore, modularised and competence-based approaches in VET curriculum were discontinued, and new curricular guidelines emphasised technical and practical training at the workshop, including the development of relatively short vocational internships, school-based or at workplaces.⁶

Finally, mechanisms of national financing and curricular planning were implemented without dismantling the decentralised system of educational administration. In particular, funding for the renovation of school infrastructure, the modernisation of workshop equipment, the implementation of teaching pairs, among other issues, and a national process of homologation of diplomas.⁷

Figure 1. Academic structure of the Argentinean Education System according to national guidelines for VET.



Source: based on national educational laws and curricular guidelines referenced.

This synthetic overview reveals that the initial cycle of secondary vocational education reforms introduced a series of changes in one direction, more aligned with the global trends of change, whereas the second phase partially reversed them. Hence, our research aimed to understand the meaning and drivers of this pendular movement in the orientation of Argentinian educational policy.

Critical review of prevailing interpretations

An overview of the most relevant literature on educational reforms in Argentina suggests a variety of explanations. First, the shift towards Polymodal education in the early 1990s was promoted by arguing that post-Fordist production paradigms demanded new skills and more adaptable profiles from workers (Albergucci, 1997). One fundamental assumption behind these arguments was the growing importance of intellectual skills over manual labour. Thus, Polymodal education was perceived as a strategy of workforce training in line with new labour market demands (Gallart, 2002), the needs of the ‘knowledge society’ or the ‘information society’ (Tedesco, 2000). However, it should be noted that these assessments were based on a broad characterisation of capitalism's productive changes and did not account for the specificity of capital

accumulation in Argentina.

Another body of research has identified productive heterogeneity and labour market segmentation in Argentina as pivotal factors influencing the adoption of Polymodal education. The central argument suggested that this educational model provides workers flexibility to navigate an unpredictable labour market within a dual-sector national economy: a sector of large industrial enterprises incorporating advanced technology and requiring highly skilled workers and a sector of small and medium-sized enterprises (SMEs) facing difficulties in modernisation, leading to unemployment, underemployment or the prevalence of low-skilled jobs.(Riquelme, 1995; Riquelme and Razquin, 1999; Riquelme and Herger, 2005). These studies addressed the specific characteristics of capital accumulation in Argentina. Nevertheless, they prompt the question of whether the coexistence of capitals with diverse scales and technological advancements might require specialised training instead of polyvalent education.

An additional explanation argued that in the 1990s, a neoliberal political agenda, focused on deindustrialisation and privatisation, led to educational decentralisation and the restructure of secondary education, dismantling technical schools (Wiñar, 1997; Puiggrós, 2005; Wiñar and Vázquez, 2007). According to this view, reforms followed the guidelines of international organisations, which promoted ‘dependence’ on developed countries, discouraging the national development of specialised technical and professional training (Puiggrós, 1996; Riquelme, 2004). Beyond the differences among this last group of studies, they share a common association between the first cycle of reforms and the dismantling of the national accumulation model implemented from the mid-1940s to the mid-1970s.⁸Many studies on the second cycle of reforms have echoed the same perspective. According to the literature, after the crisis of 2001 a new phase of economic expansion begun, but also a revival of

political determination to foster industrial growth. Consequently, there was a renewed emphasis on expanding and enhancing the quality of technical and vocational training (Novick, 2004; Almandoz, 2010). The new educational guidelines would have tended to rectify the shortcomings of the previous reforms in line with a broader political agenda focused on protecting and promoting local industries and fostering domestic market growth (Rodrigo, 2017). It is characterised as a period of ‘post-neoliberal recovery’ (Sosa, 2016), more independent from neoliberal policies of international organisations -in comparison to other Latin American countries (Maturo, 2016), that reinforced technical secondary education and encouraged the development of industries demanding qualified workers (Gallart, 2006; Wiñar, 2008).

In other words, this line of explanation regards the ‘State model’ as the main driving force behind educational policy changes. The evolution of technical education appears to align with the broader ‘development model’ or ‘pattern of accumulation’ that characterises the prevailing economic policy orientation. In essence, State policies -whether arising from political conflict or not- are perceived as the driving force shaping both the direction of the national economy and the educational reforms.

In synthesis, two overarching observations can be made among the reviewed interpretations. First, they tend to either focus on the evolving skill requirements of productive processes and labour market dynamics or on the nature of policies developed by different State models -more or less influenced by class struggle. In certain approaches, these two issues appear as interconnected, suggesting a conceptualisation of the economy, politics, and education as distinct yet interlinked domains of societal totality, that need an external linkage for analysis. Second, all approaches are grounded in the notion that each country constitutes an autonomous unit of accumulation with equal potential to develop

the productive forces of social labour but ‘the relation with’ other countries in the world market sets certain constraints. Thus, the international dimension emerges either as a contextual backdrop for national-level events or as an external determinant.

Alternative perspective

Our research adopts an alternative approach. It seeks to develop an explanation that re-establishes the interconnection between economics, politics and education, while considering national particularities as part of the global unity of capital accumulation. In other words, educational changes are being addressed as an immanent aspect of the social relations shaped by material life.

From the perspective of the critique of political economy, also known as materialist perspective, we understand education as the development of productive attributes according to the needs of the process of capital accumulation, and changes in education as a product of material transformations in global accumulation that assumes various concrete forms in each of its national segments.⁹ Let’s see this in greater detail.

Along human history societies have organized labour and consumption in diverse ways. This involved the development of the skills that their members needed to participate in different production processes and social relations. In other words, the direct or indirect assignment of physical and mental dispositions necessary for individual participation the overall process of social life. These dispositions constitute productive attributes and, in specific combinations, compose diverse and necessary productive subjectivities (Iñigo Carrera, 2008a, 2008b; Starosta, 2015). Under capitalism, education serves the production and reproduction of the labour force for the process of capital accumulation. Educational systems develop universal and differential attributes,

and the national states lead this process as the representative of total social capital (Hirsch and Iñigo, 2005; Mendonça, 2020).

The process of accumulation of relative surplus value transforms productive processes and, with them, labour force attributes, resulting in changes in schooling. However, this process is global in content and national in form. The international division of labour engender national spaces of capital accumulation and determines the historical evolution of their specificity (Iñigo Carrera, 2008a; Charnock and Starosta, 2016). Hence, the analysis of national education systems must begin with the understanding of the characteristics that the global accumulation process confers to countries (Iñigo and Rio, 2016; D. Hirsch, 2022b).

In sum, we will analyse VET reforms as changes in the magnitude of the demand for technically skilled labour force and the degree of specialisation/despecialisation of its productive attributes given the national specificity of the global capital accumulation process, in which the state acts as the guarantor of this process in its role of the total social capital representative.

However, the market-based organisation of production entails the absence of direct control over social needs, including the production and reproduction of labour force. Consequently, without an immediate or exact alignment between training demand and actual training, policies result from a process of promotion, opposition, and adaptations by various social actors representing antagonistic interests. We could generally mention individual capitals of various sizes and sectors of the economy and their collective representatives such as associations and chambers, as well as various fragments of the working class (teachers and school managers, students and their families, workers' unions, other social and political organisations). It is precisely through these diverse political actions

that the social necessity in question is indirectly fulfilled.

The research process

Design of the study

Based on the initial concerns about the analysis of changes in labour process, productive attributes and their corresponding political forms, we decided to conduct a case study. Specifically, we will focus on examining the productive transformations within an industrial sector in a particular region, the changes in labour force demands and the relationship between representatives of the business sector, members of secondary vocational schools and the implementation of state policy regarding VET as the vehicle for the changing labour force training demands.

Therefore, we will centre on the implementation of the two cycles of VET reforms in the city of San Nicolás de los Arroyos, the role played by schools and companies in this process, alongside changes in the demand for labour force training in the steel and metal-mechanical industry. Our fieldwork has included interviews and observations: in three technical schools with electromechanical orientation, which were created in different time periods and with diverse graduate profiles;¹⁰ in the steel company Ternium Siderar of Techint group; and in several small firms operating as suppliers of non-serial goods in the metal-mechanical and industrial services sector.

This case is particularly relevant for studying the major transformations in Argentina's non-agricultural industry and vocational education over the past two decades. San Nicolás, a key industrial hub in the region spanning from northern Buenos Aires to southern Santa Fe, specializes in steel and metal-mechanical production. It hosts important companies of varying scales, providing an opportunity to examine productive changes and shifts in labour demand during

periods of economic contraction and expansion in a crucial sector of the national economy. These characteristics explain the wide range of relationships between companies and schools, providing fertile ground for analysis.

Moreover, the region allows us to study the real degree of implementation of national policies in a decentralised system, considering that Buenos Aires is the sub-national jurisdiction with the highest concentration of VET enrolments and graduates and the one that most rapidly adopted/adapted national guidelines in both reform cycles.¹¹

Methodological approach

Two main considerations should be made regarding our methodology. On one hand, the empirical research and the field work in San Nicolás involved 66 in-depth, semi-structured interviews with key informants at three levels: the business sector (25), the education sector (35) and the educational policy sector (6). This body of information was complemented with visits/observations in schools and companies, as well as documentation and regulations analysis.¹²

On the other hand, the research process, based on the methodological perspective of the critique of political economy (Marx, 1997: 21), involves a particular way of organising the investigation and presenting the results.

As stated, the object of the research is the implementation of two cycles of VET reforms in the city of San Nicolás and the courses of action undertaken by both local schools and companies. However, considering political actions as a form under which an economic content is realised, it was necessary to analyse changes in the training demands for technicians. Therefore, we have studied the phases of development of the steel and metal-mechanical industry in the region, more specifically, changes in the production processes and the labour process of the company Ternium Siderar, as well as some of its small supplier companies.

However this entailed accounting for the specificities of industrial development in Argentina, which required, in turn, an understanding of its role in the unity of the global accumulation process.

Nevertheless, the exposition of research results did not follow this path. On the contrary, the link between the general determinations considered in the analysis and the more concrete ones was recreated in an inverted way.¹³ In other words, our object of analysis, VET reforms in the City of San Nicolás, it will not be presented in this article as a starting, but rather as an ending point. In fact, herein lies the method of the materialist perspective: in the ideal reproduction of the concrete by means of thought, that is, in its reproduction as a concrete-in-thought unfolding all its determinations.

Of course the method of presentation must differ in form from that of inquiry. The latter has to appropriate the material in detail, to analyse its different forms of development, to trace out their inner connexion. Only after this work is done, can the actual movement be adequately described. If this is done successfully, if the life of the subject-matter is ideally reflected as in a mirror, then it may appear as if we had before us a mere a priori construction.

(Marx, 1974: 28).

In line with this approach, we will summarise below the results of our analysis of the way in which global capital accumulation transformed production in recent decades and thereby the reproduction of the national labour force, as well as its manifestations in secondary VET reforms and the political forms in which it was deployed in Argentina.

Results

Global process of capital accumulation, productive attributes and trends of change in VET

After the second half of the 20th century, the deep global crisis of overproduction led to a process of concentration and centralisation of capital and a major change in the technical basis of production processes -based mainly on the development of microelectronics, information technology and robotisation- which encouraged the automation of labour.¹⁴ These technological developments, together with those applied to telecommunications and transport, enabled the fragmentation and delocalisation of worldwide production, configuring a New International Division of Labour (NIDL), which also transformed labour processes and, through it, workers' subjectivity.¹⁵ Let us focus for a moment on this last point.

This process is an expression of the general tendency inherent to the capitalist mode of production towards the objectification of human labour, entailing gradual codification of tacit knowledge based on physical skills and sensory perceptions applied to direct work on the object of labour. In other words, social organisation, ruled by the accumulation of capital, tends to unceasingly replace specialised or particular attributes developed through work experience (diverse among workers) with despecialised or general attributes developed primarily through formal education (universally developed) in order to operate in a more indirect way on the object of work (Aglietta, 1979; Balconi, 2002). However, recognising the existence of this general movement does not mean that it will manifest itself immediately. We could rather say that it unravels through its continuous negation (Iñigo Carrera, 2008a). Although work tasks (and therefore workers' productive attributes) tend to become less and less specific, they do not all become more complex, and so the gap between the complexity of the tasks of a sector of workers that develops technology and others that

operate with it grows wider (Starosta, 2015). This becomes even more acute with the growth of the surplus population and is reflected in differences in the reproduction of the working class, including their schooling.¹⁶

Likewise, the NIDL removes the national barriers that limited capital in this reproduction of differentiated labour force. In short, a process of despecialisation of the labour force attributes is being developed, but not as an immediate universalisation, but through a process of differentiation: while some workers expand their productive subjectivity in relative terms with those who perform the simplest work and the surplus population for capital (Iñigo Carrera, 2008a: 58-59; Starosta and Caligaris, 2017: 181-182). These transformations in the labour force take the form of a global increase in average levels of schooling and the expansion of compulsory education, favouring massive access to secondary school (Benavot and Resnik, 2006; Barro and Lee, 2015). At the same time, this educational expansion does not guarantee egalitarian schooling conditions and segmentation problems keep turning up (Acosta, 2017; Rivas and Scasso, 2017).

Another expression is the trend towards despecialisation of secondary education at global level, with important implications for technical and vocational education based on: greater enrolment in comprehensive schools, the generalisation and standardisation of low-secondary school, including the increase in subjects of general content upper secondary curriculum (Briseid and Caillods, 2004; Benavot, 2006; Kamens and Benavot, 2007), and more integration of theoretical-practical content and competence-based curricular approaches (Brockmann, Clarke and Winch, 2008; Cedefop, 2010); as well as the elimination of barriers to continue higher studies of any kind (Benavot, 2006; Unesco-Unevoc, 2006). The result for Initial VET is fewer and broader qualifications with strengthened general education components and transversal

skills (Maclean and Pavlova, 2013; Cedefop, 2023).

Likewise, educational differentiation has been deepened by several institutional forms. The diversification of VET provision is being deployed by increasing autonomy of providers in curriculum design and delivery, individualisation and flexibilisation of educational pathways by modularised and unit-based approaches along with new methods for validating non-formal learning (Green and Wolf, Alison and Leney, 1999; Benavot, 2006; Maclean and Pavlova, 2013; Cedefop, 2023).

Such changes in national education systems and VET were prompted by reforms recommendations that international organisations had made since 1960 onwards, but only generalized by 1980s and 1990s, mediated by international financial loans (Pronko, 2000; Heyneman, 2003). As supranational agencies they represent the general needs of global capital accumulation.

Nevertheless, the concrete development of these transformations varied depending on the specificities of each national space of accumulation, or in other words, their role in the NIDL. In the following, we will consider the case of Argentina.

National specificity of capital accumulation, labour force training needs and VET reforms in Argentina

A detailed look at the two cycles of VET reforms in Argentina , reveals three trends in line with global transformations. Even though there were more pronounced in the first cycle (beginning 1990s – mid 2000s) than in the second one (mid 2000s – mid 2010s), the overall direction remained unchanged.

Firstly, there has been a decrease in VET enrolment in relation to the total

number of high school students. While it had been growing, reaching 25% of students in the mid-20th century, it fell by about 14% after the first cycle of reforms and recovered only to 16% during the next second cycle. Besides, despite the intended promotion of qualifications in the service sector during the first phase, VET enrolment remains strong in traditional orientations, particularly, electromechanics and construction. Though in the second phase, there was an increase of enrolment in informational degrees.¹⁷

Secondly, the decentralisation of educational administration provided institutional conditions that favoured educational differentiation. On one hand, jurisdictional autonomy in implementing the first cycle of reforms led to a variety of curricular and institutional models. This resulted in some provinces maintaining the traditional pre-reform VET model while others saw relative modernisation with severe impacts on education quality or, in a third case, transformed technical schools into general high schools offering some job training programmes (Gallart *et al.*, 2003; Gallart, 2006).

Additionally, the varying technical and financial capacities of provinces to implement reforms and assume new responsibilities intensified this differentiation process (Riquelme, 2004). It's important to consider that decentralisation was not reversed during the second cycle of reforms, and the national government's efforts to unify the educational system were limited. For instance, although a National Financing Fund for Technical-Professional Education was created in 2005 and had been expanded steadily from 2006 to 2014, half of the funds were allocated through competitive mechanisms that required schools to submit institutional improvement projects (INET-ME, 2015). This approach resulted in unequal access to infrastructure and equipment upgrades, with only 900 out of 1,500 schools receiving funds between 2006 and 2010 (INET, 2010).

On the other hand, despite the implementation of a national degree standardisation process, broad criteria in terms of curricular content and time allocation have led to a significant variation of qualifications within the same specialisation between and within jurisdictions. The table below shows hundreds of different curricular proposals for the same socio-productive sector.

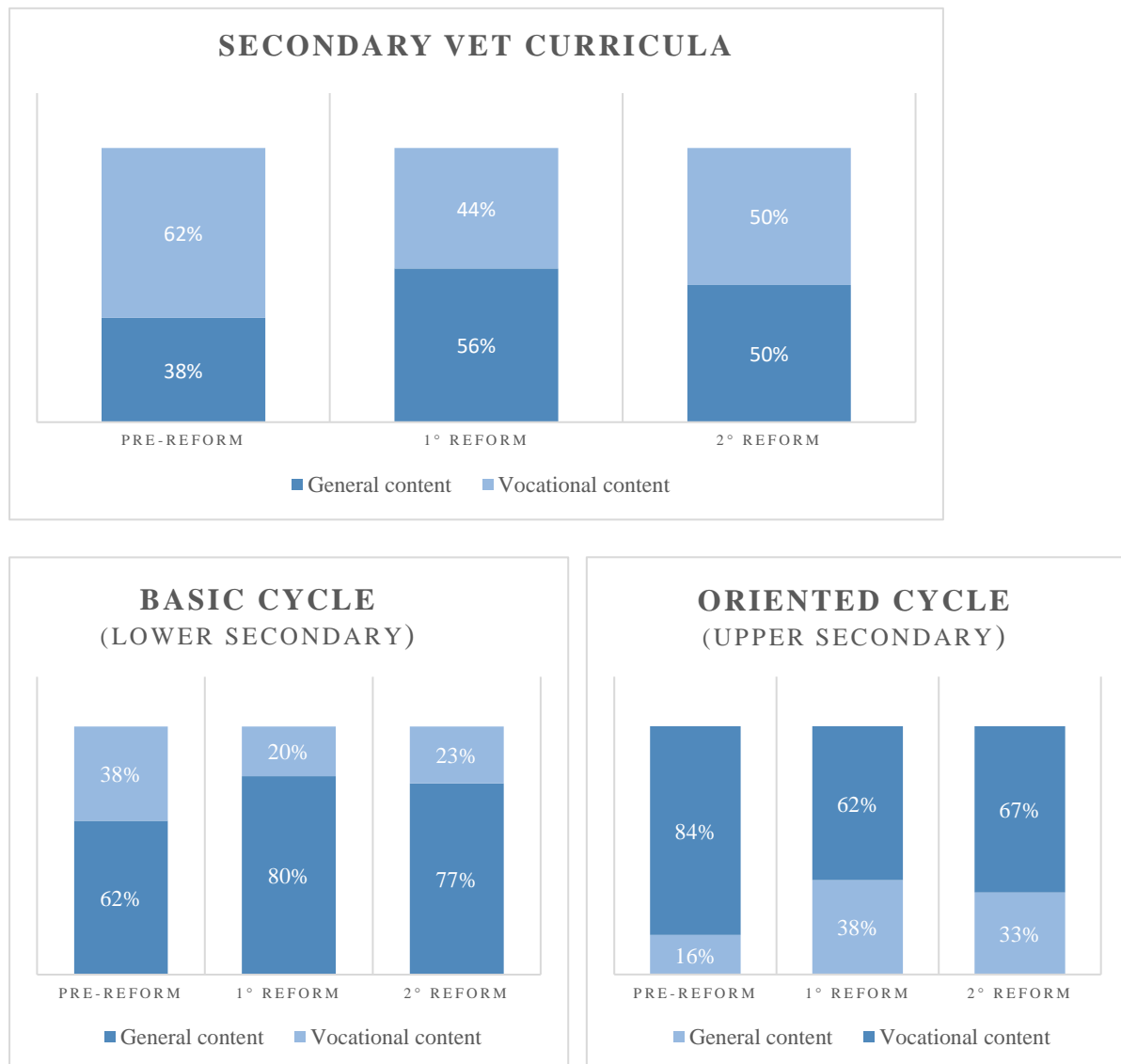
Table 1. Secondary VET programmes registered in the National Catalogue of Degrees and Certifications by productive sector. Total country. 2015.

Productive sector	Public Offer	Private Offer	Total Degrees
Electromechanics	473	42	515
Agriculture & Animal Husbandry	413	71	484
Construction	307	21	328
Computing	244	21	265
Electronics	166	24	190
Process Industry	145	12	157
Administration	120	13	133
Mechanical Engineering, Metal-mechanics & Metalworking	95	6	101
Food Industry	80	7	87
Automotive	69	3	72

Source: Based on data from INET (2015).

In third and last place, we have registered a process of de-specialisation of technicians' profiles. National curricular guidelines of the first cycle of reforms intended to delay and shorten technical training, increasing academic or general education hours and integrating theoretical and practical content. These changes were only partially reversed by the curricular framework of the second cycle of policies. The following table illustrates the evolution of school time allocation between general and VET content in the province of Buenos Aires before and after the implementation of both reform cycles.

Figure 2. General and vocational content (hours) in Secondary VET curricula (electromechanical orientation).



Source: Hirsch (2022)¹⁸

In order to explain the direction and pendular movement of these educational reforms we will identify the specificity of capital accumulation in Argentina and the determinations this entails for the reproduction of local labour force.

First, we should note that the global process of accumulation engendered Argentina as a producer of agricultural commodities for the global market,

earning exceptional profits (land rent) due to its unique natural conditions (Iñigo Carrera, 2007b; Grinberg, 2024). The demand for VET wasn't significant until the mid-20th century, aligning with industrial development known as Import Substitution Industrialisation (Tedesco, 1977). This phase consisted in a proliferation of low-productivity capitals sustained by the transfer of this exceptional mass of wealth undergoing rapid expansion -small national capitals initially, and segments of medium foreign capitals using outdated technology later (Iñigo Carrera, 2007b; Grinberg, 2024).

In contrast, when commodity prices fell due to the international overproduction crisis in the mid-1970s, an economic contraction began. By the 1990s, the relative insufficiency of appropriable land rent compared to the scale of accumulation -needed to offset the widening global productivity gap caused by technical changes and the new international division of labour- led to a decline in demand for technically skilled labour as small industrial capitals were eliminated (Iñigo Carrera, 2007b; Kornblihtt, Seiffer and Mussi, 2016; Grinberg, 2022).

Therefore, the first cycle of educational reforms revealed a social need for economic contraction, rather than a widespread advance of automation and subsequent despecialisation of the industrial labour force, which was occurring in other leading national economies, as suggested by the analysed bibliography. However, the Argentinian industry was not totally dismantled. Instead, capital concentration and centralisation, particularly in steel and automotive sectors, facilitated a certain degree of technological modernisation, restructured labour organisation, and expanded access to regional export markets (Kornblihtt, 2011; Fitzsimons and Guevara, 2018). Which not only explains the partial advance of de-specialisation, but also the consolidation of educational differentiation across jurisdictions, regions, and schools.

An apparently inverse movement began after 2002, driven by a significant increase in foreign currency inflow from land rent under favourable global accumulation conditions. This reactivated all the previous rent transfer mechanisms, promoting the expansion of small and medium-sized industrial capitals operating in the domestic market (Iñigo Carrera, 2007b; Kornblihtt, Seiffer and Mussi, 2016; Grinberg, 2022) that maintained an electromechanical technical base (INET, 2009). Consequently, there was an increased demand for technicians and a need to partially reverse the despecialisation of VET curricula. These changes were facilitated through the second cycle of educational policies.

However, it should be pointed out that the reinforcement of technical secondary schools ran contrary to the global trends previously mentioned: the shift towards general over technical education, the differentiation of educational institutions, and the proliferation of educational pathways. Rather than the strength of domestic industry, this highlights its reproduction on a precarious basis, which hinders the development of social productive forces.

This also challenges the most widespread interpretations of both reform cycles concerning the link between politics, economics, and education, as summarized earlier. The back-and-forth of reforms in Argentinian technical secondary education was not a result of implementing contrasting political and economic models but rather reflected the varying labour force training needs for each phase of economic contraction and expansion in a capital accumulation process that maintained its specificity. Antagonistic political forms were the mode of realisation, but not the content, of these material needs.

Nevertheless, this process was far from immediate. On the contrary, it has been unfolded through the confrontation of various social interests. For this reason, our investigation continued with the study of the how the demand for labour

force training (specifically secondary school technicians) was addressed through juridical-political relations among representatives of individual capitalists, workers, and the State as the representative of the social capital in San Nicolás de los Arroyos.

Local case study: political forms in which labour force training needs are realised

San Nicolás became an industrial city specializing in steel and metal-mechanical production with the establishment of the steel producer SOMISA in the early 1960s. This led to the proliferation of small capitals in the region, including client companies in the metal-mechanical sector, to which SOMISA supplied steel below its production cost, as well as supplier companies providing industrial goods and services to support SOMISA's operations (Mussi, 2014).

In the 1990s, the region experienced a contraction in industrial employment. However, this was not a process of deindustrialisation but rather the elimination of small surplus capital, accompanied by productive restructuring that reduced the number of workers without diminishing production (Filippo, Mazorra and Schleser, 2005). SOMISA's privatisation by the Techint group (since then called Ternium Siderar) is representative of this process of concentration and centralisation of capital: the company incorporated technological innovations, altered job structures, and redefined tasks, changing the attributes required from workers (Soul, 2002).

On one hand, the introduction of computerisation in production process control and labour management led to the despecialisation of the workforce profile, with varying degrees of progress depending on the level of labour objectification in each sector of the plant. ¹⁹

Operation workers began to mobilise fewer specific productive attributes for sensory/manual intervention in the production process, relying more on general attributes for indirect intervention mediated by computer control (although working in the process industry already involved a significant degree of indirect intervention).

Maintenance workers also experienced despecialisation of their tasks, mainly due to the formation of work groups that integrated planning and execution and merged several specialties. This shift was also influenced by the change from corrective maintenance to preventive and predictive maintenance, which relied on routines that anticipated replacements to prevent failures and breakdowns. However, their tasks still required a greater extent of specialised knowledge developed through work experience compared to Operations roles. The increased importance of work orders, attempting to codify these tasks, reflects this trend.

Changes in the productive attributes of Ternium Siderar's labour force contrast with the relative stability in SMEs, which did not undergo deep reorganisation of the work process and tasks between the mid-1990s and the early 2000s. These SMEs maintained a separation of planning and execution tasks, individually assigned work, and low autonomy for workers (Schneuwly, 2004).

After 2002, the region entered an expansive phase of industrial production, leading to a growing demand for workers with non-university technical and operational profiles -a demand difficult to meet. Ternium Siderar continued to increase its profit margins and adopt productive innovations during this period. Concurrently, SMEs multiplied, but without altering their technical base or modes of production organisation.

In essence, the case study suggests that despite the fluctuations between contraction and expansion of industrial employment over the two decades under analysis, there has been a tendency towards reduced demand for technicians and a shift towards less specialised job profiles. These trends unfolded differently, with varying degrees of impact depending on the type of capital and even on the nature of labour processes in different sectors within the same capital.

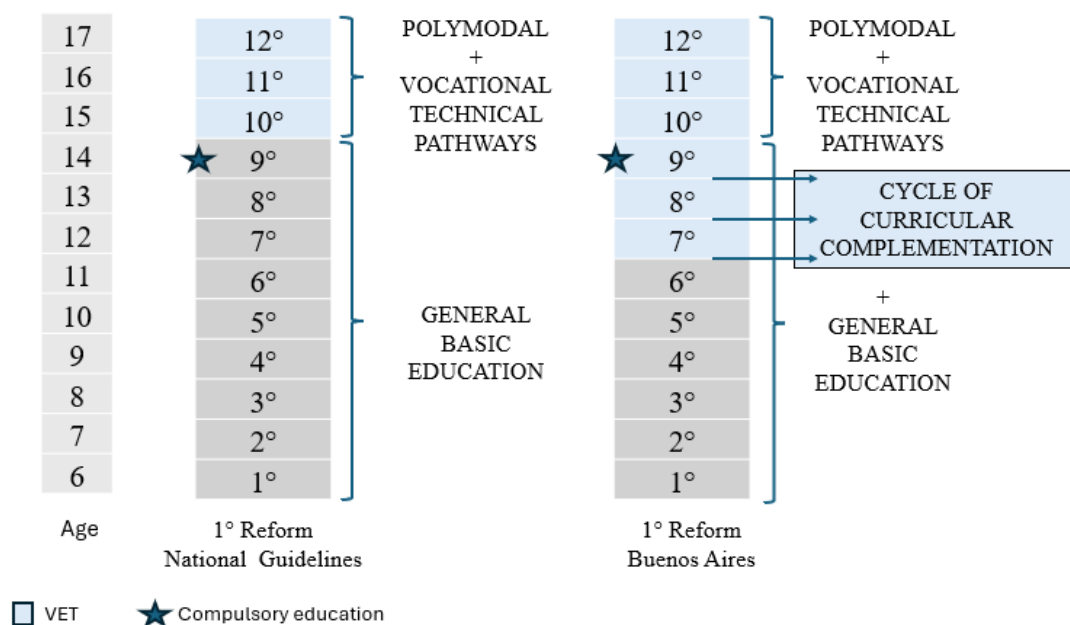
Both the changes in labour force demand magnitude and the degree of specialisation/despecialisation of its profile in the region under study were driven by two phases of educational policies resulting from a process of promotion, opposition, and adaptations by various social actors representing antagonistic interests. We will now focus on the role of VET schools and Ternium Siderar during these two cycles of educational reforms. However, future analyses could expand the study of the interests of other fragments of the business sector and the working class.

During the 1990s, the company disengaged from the management of their VET school (School C) and focused on the internal training of its employees in order to implement the productive restructuring previously described. Meanwhile, certain schools in the region, including School A, noted a decline in technical enrolments and educational completion rates. They also observed outdated study plans and lacked the necessary economic and human resources to maintain educational quality. In response, these schools proposed an experimental curriculum that received formal approval. This plan anticipated some elements of the first cycle of reforms by shortening the duration of secondary education, making it more general, and offering technical education as an option in a single school per region equipped with modern facilities.

Beyond these proposals, the three schools under analysis strongly opposed to

the changes in academic structure and curricular design of new national guidelines. The jurisdictional implementation allowed the establishment of a Complementary Curricular Cycle of VET for years 7th to 9th of Basic General Education. This was intended to articulate with the Vocational Technical Pathway of Polymodal in grade 10th to 12th, thus continuing the traditional 6-year VET model (Figure 3). An association with primary schools was necessary to integrate these last 3 years into secondary schools. In San Nicolás, an intense dispute over the selection of schools to establish this articulation took place.

Figure 3. Academic structure of Buenos Aires Education System.



Source: based on national and jurisdictional laws and regulations.

Besides, with jurisdictional approval, schools never implemented Vocational Technical Pathways (TPPs) as an elective track to complement secondary education, nor did they implement the modular curriculum design approach. Those who chose such a school were required to attend all the subjects of the specialty and would graduate as both a technician and a Polymodal graduate.

Furthermore, the institutional autonomy proposed by the new legislation

allowed schools to make pedagogical decisions that, in their own words, ‘softened’ the impact of the reformed curricular design. This was achieved by integrating the content of specific subjects and workshop activities of the old curriculum into the curricular units of the new one (‘modules’ which were common to all schools in the jurisdiction and ‘Institutional Definition Units’ designed by each school). For example, within the unit ‘Mechanical Technology’ old manual workshop techniques were still taught.

Despite the increase in the number of hours devoted to general knowledge, interviewees noted minimal impact on changes in pedagogical approach. The shift from teaching based on demonstration and practice of manual techniques to learning based on problem situations and projects was moderate.

New regulations, which increased schools’ decision-making, also led to a growing polarisation. Varying institutional capacities to handle academic, curricular, financial and managerial changes deepen the gap between improvement and deterioration of educational proposals. An example of successful adaptation is the agreement between Schools A and C and the National Technological University of San Nicolás (UTN). This agreement enabled schools to control teacher selection processes in order to maintain the quality and specificity of their training proposals while preserving aspects of the pedagogical profile and educational practices of the pre-reform VET model. In contrast, School B did not benefit from such an agreement and faced a deep crisis from the mid-1990s through the first decade of the 2000s. This crisis included a decline in enrolment, dissolution of its management team, high teacher turnover, loss of the original school building, and deterioration of infrastructure and workshop equipment.

In short, the implementation of the first cycle of VET reforms in San Nicolás

became the vehicle for the contraction in enrolment, the shift towards a relatively more despecialised training profile, and the deepening of pre-existing differences between schools. Based on the analysis of the region's productive transformations, we can assert that the strength of the schools in resisting a deeper despecialisation, as proposed by the new national guidelines, was rooted in the continued, albeit contracted, demand for specialised technical training. Similarly, the weakness in resisting differentiation between schools was due to the contraction in social demand for technically trained labour and the growing gap between the profiles demanded by capital according to the degree of advancement in labour objectification. This, in turn, led Ternium Siderar to withdraw from influencing school education and focus instead on training its own workers.

The company's absence in the educational field began to change during the early years of the new century. After identifying the lack of preparation among new employees, Ternium Siderar developed a one-year training program and gradually transferred this instruction to some VET high schools in the region. This led to the creation of the Programme for the Strengthening of Technical Schools in 2006 (FETEC for its acronym in Spanish, now called GEN TÉCNICO). The program offered training activities for students, provided funding for school infrastructure and equipment improvements, supported curricular content development, and offered teacher training. However, the focus was undoubtedly the development of internships within the company during the final year of studies. These were implemented seven years before the jurisdiction mandated professional internships according to national regulations.

Students and teachers indicated that tasks at the plant required not only manual dexterity and sensory skills but also the development of general learning skills, which the company termed 'management skills': knowing how to create and

interpret working orders, analysing plans, reading communications, and so forth. Additionally, the development of group work skills and the ability to be accountable for work results were part of the expected learning outcomes during these internships.

Testimonies from schools show that resistance to the first cycle of reforms was crucial for the quick recovery of specialised technical training during the second cycle of changes. This ‘back and forth’ movement of policies ultimately established a sort of ‘middle ground’ in the type of training provided by schools. Thus, the prevailing curriculum of VET between the mid-1960s and 1990 was updated, correcting what were considered to be the errors of the first cycle of reforms: there was a return to a 6-year training program (7-year in some jurisdictions) with a strong emphasis on workshop practice; equipment was renewed, and some automated machines, such as CNC lathes and 3D printers, were incorporated; curricular units were once again based on specific training and mastery of manual work techniques but with some integration of theory and practice and some progress in project-based teaching was made (although incipient and not generalised in all schools).

On the other hand, teachers and principals reported a continuity of differentiation between schools despite state policies aimed at reducing it. In fact, these policies often fostered polarisation between schools. The institutions analysed received very different levels of funding for equipment and infrastructure improvements and had varying opportunities to train their teachers and students. These differences were influenced by their connection with Ternium Siderar through FETEC and the Fiscal Credit line, as well as their ability to develop Institutional Improvement Plans and obtain part of the National Financing Fund. School B only managed to be summoned by the company and get a management team back together to present Improvement

Plans in 2014.

To summarise, the implementation of this second cycle of educational reforms in San Nicolás reflected capital's need to increase the number of technicians and strengthen their specialised training during an expansive phase of the region's accumulation, without completely reversing the process of de-specialisation and differentiation of their profiles initiated in the first cycle of reforms. The schools' ability to resist the elimination of VET traditional characteristics in the first wave of reforms was the condition that made possible a quick restoration during this period of greater social demand for technicians. The companies' ability to influence regulations and implement their initiatives to establish link with schools expressed the need to multiply and support the formation of the workforce, both their own and that of the small capitals acting as clients and suppliers. In this regard, professional internships were a privileged means for individual capitals to take on tasks that the state, as the representative of the total process of capital accumulation, was not able to quickly assume. Nevertheless, the continuity of educational differentiation through these same forms of company-school linkage, despite the existence of state mechanisms intended to reduce it, reaffirms the persistence of both the gap between the profiles demanded by individual capitals and the existence of a surplus labour force for capital's needs.

Conclusions

The course of our research revealed that both cycles of secondary VET reforms in Argentina resulted in partial progress aligned with global trends: enrolment tended to shrink, the decentralisation of educational administration created favourable conditions for educational differentiation, and curricular reforms promoted the despecialisation of technicians' profiles. Although the effect was more pronounced in the first cycle (early 1990s to mid-2000s) than in the

second cycle (mid-2000s to mid-2010s), the overall direction remained unchanged. This pendular movement was driven by the extent and level of specialisation required by the national process of capital accumulation as part of the global one.

Argentina, like other Latin American countries, has historically participated in the international division of labour through the production of agricultural commodities for the world market. The favourable and non-reproducible conditions of its means of production generate an extraordinary rent which, through various transfer mechanisms, has sustained the valorisation of industrial capital (both national and international), lagging behind average world productivity but producing for the protected domestic market. Changes in the process of global capital accumulation in the last third of the 20th century made this mass of income insufficient to sustain the domestic industry. Therefore, the first wave of reforms reflected a social need to contract industrial labour force training, rather than the widespread advance of automation and subsequent despecialisation of labour skills seen in other leading economies. However, Argentine industry was not entirely dismantled and the concentration and centralisation of capital in certain sectors led to moderate technological modernisation. This explains why the reforms resulted in partial advances in educational despecialisation and differentiation.

At the beginning of the 21st century, the conditions of global accumulation expanded the mass of land rent in Argentina, enabling the growth of small capitals operating with outdated technology. Consequently, the second cycle of reforms reflected the need to increase the training of technicians and to partially reverse their differentiation and the despecialisation of VET curricula, even though this expansive phase was supported by the same precarious foundations as before.

However, the overall process was unfolded through the confrontation and collaboration of various stakeholders (businesses and schools) and state legislation, as indirect means to fulfil this social need. There is no immediate or exact alignment between the demand for training and the actual training provided; this unity is achieved through political action, and consequently, through the confrontation of various social personifications.

Our analysis of the steel and metal-mechanical sector's productive and labour transformations in San Nicolás city (Buenos Aires, Argentina) illustrated how political action of VET schools and companies operated by promoting and/or resisting state regulations during these two cycles of educational reform and channelled the unity of the social organisation process. The strength of agents to press for the realisation of their particular interests was the way in which the social need for labour force training in the region was realised, determined fundamentally by the characteristics of capital accumulation in Argentina as a national fragment of what is a global unit.

Ultimately, the implications of this study extend beyond Vocational Education and Training in Argentina. By addressing the development of two apparently opposed reforms cycle we expect to contribute to a broader understanding of educational changes in Latin America and hope to inspire further research based on the perspective of the critique of political economy. This analytical approach involves understanding educational changes as a product of material transformations in global capital accumulation, which take concrete forms in each national context, along with class conflict and state regulation as necessary political mechanisms for their realisation. While VET provides a clearer lens for such analysis, due to its direct connection to the occupational participation of trainees, the challenge lies in applying this perspective to study other characteristics of educational systems.

Notes

¹ The Baccalaureate, Commerce schools and Normal schools (focused on teaching training) were the other most important secondary programmes. The last two were never considered part of VET even though they included job-oriented content.

² Federal Law of Education (Law N° 24.195, 1993); Baseline Documents on Vocational Technical Pathways (Resolution CFCyE N° 86, 1998).

³ Document Series A N°12: Framework Agreement for Vocational Technical Pathways (Resolution CFCyE N°55/96, 1996).

⁴ Educational Services Transfer Act (Law N° 24.049, 1991).

⁵ National Education Law (Law N°26.206, 2006); Technical Vocational Education Act (Act N° 26.058, 2005). As a result of this reform, some provinces returned to the old academic structure of 7 years of Primary and 6 years of Secondary school, while others implemented a 6-6 year scheme.

⁶ Guidelines for the homologation of Secondary Level Vocational Qualifications (Resolutions CFE, several years since 2007).

⁷ Document "Continuous Improvement of the Quality of Technical Vocational Education" (Resolution CFCyE N° 62/08, 2008; replacing the document approved by Resolution CFCyE N° 269/06 and CFCyE N° 250/05).

⁸ The more or less explicit assumption is that this model of accumulation based on imports substitution would have been replaced by a neoliberal ideology based on "deindustrialisation" accompanied by the opening to the entry of imported goods, as well as foreign debt and "financial valorisation", in benefit of the most concentrated capitals that "diversify" their production and in detriment of "small and medium national capitals" which, in short, are the ones that employ the greatest number of workers. This approach is presented more explicitly by Wiñar (1997) and subsequently adopted, in some aspects at least, by other authors, thus becoming the predominant interpretation so far (Maturo, 2014; Sosa, 2016; Rodrigo, 2017).

⁹ This perspective is based on the recognition of the progress made by Karl Marx (1974) the following work of Iñigo Carrera (Iñigo Carrera, 2007; 2008a) as well as his own original developments. Some works have been fundamental references because they have faced more directly the need to reassemble the unity between education, politics, and economics as a constitutive part of the social totality reproduction (Hirsch and Iñigo, 2005; Mendonça, 2020). It is worth anticipating that our perspective opens debates with non-Marxist approaches, such as the functionalist ones, which naturalize the way in which social production is organized. But also, within Marxism itself, about the autonomy of education from economy, national autonomy from global accumulation, the role of class struggle and political action, as well as the existence of a general trend in the transformation of education and its direction. For further details about this approach, see Hirsch (2022b).

¹⁰ School A was established in the mid-1920s for non-formal vocational training, and in the early 1950s, it became the first VET secondary school in the region. School B was founded in 1940 and provided parallel training to VET secondary schools with a greater emphasis on practical work experience in workplaces. Eventually, it became a VET secondary school but always maintained a special program for active workers. School C was created in the mid-1980s as a Private Factory School through an agreement between SOMISA (now Ternium Siderar) and the state. Informants state that while School A trained students for technical management roles, School B focused on preparing them for operational positions. School C, consolidated as an elite institution: selecting students and teachers and maintaining a cutting-edge status in the region by rapidly modernizing its curricular designs and workshop equipment. See Hirsch (2022a: 21-24; 462-63) for further details on the fieldwork methodological criteria.

¹¹ According to data from the Statistical Annual Reports of the National Ministry of Education, Buenos Aires has approximately 30% of VET schools and VET enrolment as well as 40% of VET graduates along the country.

¹² 1) Business sector: Ternium Siderar workers, training and community relations officers; owners/managers of small capitals suppliers and customers of Ternium Siderar; officers of industrial parks and business associations, etc. One group of interviews was facilitated by my co-director Julia Soul (2001-2005) and another group was conducted by myself (2012 and 2017). 2) Education sector: VET schools principals, teachers, workshop head, professional practice coordinators, students (2013-2018). 3) Education policy sector: key figures in the design or management of local and national education policies between (2013-2015). This paper summarises the main findings of the fieldwork, but a detailed analysis can be found in Hirsch (2022a: 243 ff; 309 ff; 351 ff).

¹³ With "determination" we do not simply refer to something necessary, in the sense that it cannot occur in any other way. By determining we allude to a movement in which a content finds its limit, is realized, and in the process becomes a new form, a new configuration. See Iñigo Carrera (2008a: 260-262) and Pérez Soto (2008: 113-115; 119-121) for a deeper understanding of this difference between "determination" (as "possibility" and "necessity") for dialectical knowledge and "causality" for the formal logic of modern thought (cause-effect as a relation of external configuration, whether in a single sense or reciprocal).

¹⁴ For detailed analysis of the serial goods industry see Coriat (1992) and for the process industry see Hasegawa (1996).

¹⁵ Traditionally, the international division of labour was established between industrialized countries and countries producing primary commodities for the international market; but now it also includes countries specialised in the simplest parts of industrial production. See the seminal work of Fröbel, Heinrichs and Kreye (1980), the following progress made by Iñigo Carrera (2008a: 53-94) and the more recent work developed on this basis compiled in the book of Charnock and Starosta (2016).

¹⁶ The thesis supporting the trend towards deskilling originally formulated by (Braverman, 1975) does not consider the difference between immediate manifestation and general tendency. Therefore, argues that the increasing simplification of jobs and the amount of surplus population constitute the direction of the trend, while from our point of view is a countertendency in the movement towards its disappearance. Marx (1974) made a similar consideration over the expansion of rural home-based industry as part of the movement towards its replacement for manufacture production.

¹⁷ Based on: Bonantini (2000), Gallart et al. (2003) and Statistical Annual Reports of the National Ministry of Education.

¹⁸ Based on: National Curricular Design of ENETs 1965 (Pre-reform); Curricular Designs of Buenos Aires 2002 for Basic General Education + Cycle of Curricular Complementation and Polymodal + Vocational Technical Pathways (1° Reform); Curricular Designs of Buenos Aires 2009 for Vocational Secondary Schools (2° Reform).

¹⁹ Operation work involves workers' intervention using the means of production in areas such as Reduction, Steelmaking, and Steel Rolling, while Maintenance work entails workers' intervention to verify the condition of the means of production and repair them. Based on semi-structured interviews, Blast Furnace Operation work (in the Steelmaking area) and various Maintenance tasks were analysed. Maintenance tasks were examined in the Central Maintenance Workshop (operating in all areas), in the Converter (Steelmaking), and in the Port (Reduction). For more detail see Hirsch (2022a: 243 ff).

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