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ARTICLES

From the training of Artificers to the Federal Network of Professional, Scientific, and Technological Education [1] [2] [3] [4]

Da formação de artífices à Rede Federal de Educação Profissional, Científica e Tecnológica

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Abstract

The study aims to outline the power, dependence, and exclusion relations in the Federal Network of Professional, Scientific, and Technological Education and its implications at the organizational level and aspects of the composing institutions. This is documentary research, and its corpus consists of official documents, bills, laws, reports issued by federal bodies, electronic pages, and academic productions. The Eliasian theory was used, employing established and outsider categories. The 19 Schools of Apprentice Artificers represent the genesis of the Network, which, despite tensions, was politically expanded. The advance to higher levels of education materialized in institutional transformations has the Universidade Tecnológica Federal do Paraná as an inflection point. The Ministry of Education has been proposing policies to curb the individual application of Network members for higher levels of education. The most noticeable movement in this direction was the establishment of the Federal Institutes of Education, Science, and Technology. In conclusion, as a pulsating configuration, the network was built between the stigma of offering a species of second-class education aimed at the most disadvantaged classes (ÉRGA) and the search for a superior status (ÉPEA).

Keywords: School of Apprentice Artificers, Federal Network of Professional, Scientific, and Technological Education, Technological Education

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Resumo

O estudo tem por objetivo estremar as relações de poder, dependência e exclusão existentes na Rede Federal de Educação Profissional, Científica e Tecnológica e suas implicações nos níveis de sua organização e nos aspectos das instituições que a compõem. A pesquisa é documental, e seu corpus é formado por documentos oficiais, projetos de lei, leis, relatórios emitidos por órgãos federais, páginas eletrônicas e produções acadêmicas. A lente teórica utilizada, com o uso das categorias estabelecidos e outsiders, é a teoria eliasiana. Constatou-se que as 19 Escolas de Aprendizes Artífices representam a gênese da Rede, que, apesar das tensões, foi ampliada politicamente. O avanço para níveis mais elevados de ensino, materializado em transformações institucionais, tem como ponto de inflexão a Universidade Tecnológica Federal do Paraná. O Ministério da Educação vem propondo políticas para frear o pleito individual dos membros da Rede para níveis mais elevados de ensino. O movimento mais notório nesta direção foi a implantação dos Institutos Federais de Educação, Ciência e Tecnologia. Conclui-se que a Rede, enquanto uma configuração pulsante, foi construída entre o estigma de ofertar uma espécie de ensino de segunda classe, destinada às classes mais desfavorecidas (ÉRGA) e a busca de um status superior (ÉPEA).

Palavras-chave: *Escola de Aprendizes Artífices, Rede Federal de Educação Profissional, Científica e Tecnológica, Educação Tecnológica*

Introduction

The First Charter of the Federative Republic of Brazil was approved in 1891. It guarantees the public character of primary education, literacy, and professional education. The provision of primary education should be free, secular, and the responsibility of the states, except for the Federal District, for which the Union is responsible (Carvalho, 2017).

The Republic was born still quite rural. In its first years, municipalities transformed their profile to meet the new demands, including that of national migrants and foreign immigrants. Infrastructure was necessary to accommodate everyone. People lacked housing, roads, and spaces for commerce. Food, clothing, and hygiene were needed (Sá, 2014).

The number of children circulating the streets without occupation increased in the emerging urban centres – they were the so-called "unlucky". From Decree nº 7,566 of September 23rd, 1909 (Brazil, 1909), signed by President Nilo Peçanha, the *Escolas de Aprendizes Artífices* (EAA, Schools of Apprentice Artificers) meant hope for changing the lives of a few children of this public, in 19 capitals.

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The schools created in 1909 produced a configuration that was systematically expanded in the course of its history. In the long term, this path of the now-structured Federal Network of Professional, Scientific, and Technological Education is the object of this study. Related themes were researched in the literature, including the creation of Schools of Apprentice Artificers (Carvalho, 2017; Soares, 1981); their initial characteristics (Soares, 1982); the Brazilian educational policies from the EAA to the Federal Institutes of Education, Science, and Technology (FI) (Sell, 2019); studies of the EAA of Rio Grande do Norte until it became the FI of Rio Grande do Norte (IFRN) (Medeiros Neta et al., 2012); and studies of the EAA of Curitiba until the transformation into the Centro Federal de Educação Tecnológica (CEFET) (Guimarães, 2001) and the Universidade Tecnológica Federal do Paraná (UTFPR) (Cechin, 2019; Helmann, 2019; Matos, 2009). We did not find a panoramic study focusing on Brazilian technological education. The closest, focusing on educational policies, was by Sell (2019).

The *corpus* of the present research consists of official documents, such as laws and reports issued by federal education agencies, the electronic pages of the institutions originating from the EAAs, and academic productions.

When treating the sources, we consider that official documents modulate reality but cannot be understood as unilaterally constructed. The documents are products of a specific socio-historical context and are transposed by discourses in their composition.

The sources were discussed through the lens of the sociology of power relations. The categories used were the "established" and "outsiders", proposed by Norbert Elias and John L. Scotson in *Os estabelecidos e os outsiders*[5] (Elias & Scotson, 2000). Attachment and the idea of a deteriorated identity are categories permeated by stigmas to outsiders. The theoretical model assumes an understanding of the configuration and interdependence relations in the object under examination. According to the Eliasian theory, the reading is done long-term. This is more than one century and the sociogenesis of the State. With the proposed approach, we examine the emergence of social settings as an unexpected effectiveness of social interaction. Such an approach can be characterized as a thorough inquiry into psychogeny and sociogeny (Elias, 1997).

[5] "The established and the outsiders".

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Psychogeny outlines the long-term development of psychic structures and the modifications of human behavior. Elias' concern centres on the structures and mechanisms of regulation and control of emotions and the social formation of the superego. His work examines the transition from exterior coercive mechanisms to interior coercive mechanisms - a kind of internalization, disciplinarization of oneself.

In turn, sociogeny outlines the long-term development of social structures. The transformation of society was an ever-present concern at the heart of Elias' works. In *O processo civilizador*[6] (1994), Elias establishes relationships between civilization and the formation and consolidation of the modern State. This is a process of centralization towards the monopolization of territories, taxation, and the use of violence, which began to determine an increasing degree of dependence and functionalization, regulation, coordination, and interaction of social processes.

This study was generated in unwritten pages of the history of Brazilian technological education. It is based on Eliasian theory and aims to outline power, dependence, and exclusion relationships in the Network and their implications on the organization levels and aspects of the composing institutions.

Origins of the Federal Network of Professional, Scientific, and Technological Education

Brazilian technological education was born in the military public sphere and at the higher level, still in Colony-Brazil, in 1782 in Rio de Janeiro, with the installation of the *Academia Real de Guardas - Marinha*[7]. The educational institution gained its current name in 1886, *Escola Naval*[8] (Marinha do Brasil, 2021). The establishment of the Royal Academy followed the initiative, also in Rio de Janeiro, in 1792. The army's engineering school was the first in the Americas and the third worldwide. The institution received its current denomination, *Instituto Militar de Engenharia*[9] (IME), after several name changes, demilitarization, and a new militarization, in 1949. In 1964, the IME also returned to admitting civilians (Instituto Militar de Engenharia, 2021). The *Instituto*

[6] The civilizing process.
[7] Royal Academy of Guards - Marine
[8] Naval School
[9] Military Engineering Institute

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Tecnológico de Aeronáutica[10] (ITA) was founded in 1950 in the municipality of São José dos Campos, São Paulo, devised by Alberto Santos-Dumont (1918), and inspired by the Massachusetts Institute of Technology (MIT) (Instituto Tecnológico de Aeronáutica, 2021). Embraer's embryo, ITA has become a reference for quality education, cutting-edge research, and a strong relationship with the productive sector (Forjaz, 2005).

Although successful and perennial, military institutions of higher education with high symbolic capital have historically been little accessible and have a derisory or nonexistent role in the Brazilian technological education from which they originated (Lara et al., 2021). In this sense, the institutions are a world apart.

Technological education has 1909 as its initial temporal goal in the civil public sphere. In reality, some characteristics of the monarchical regime (1822-1889) remained after the Proclamation of the Republic, which officially took place on November 15th, 1889 (Brazil, 1889). The context of the early 1900s made industrial apprenticeships necessary because of the changing economy and increasing complexity of the traditional division of labor.

The viability of industrial learning emerged with Decree n° 1,606 (Brazil, 1906), which created the Ministry of Agriculture, Industry, and Commerce Businesses, responsible for matters related to professional education, among others. In 1909, this Ministry was renamed the Ministry of Agriculture, Industry, and Commerce and had the support of the oligarchic faction, imbued with industrialism and agrarian ideas, which Nilo Peçanha shared (Carvalho, 2017).

Nilo Peçanha was a part of the political sphere of Brazil since 1891 when he served in the National Constituent Assembly for two legislatures, was a deputy and Senator for Rio de Janeiro, and a Minister (Cunha, 2000a). He was Vice-President of Brazil during the Affonso Penna government from November 15th, 1906, until his death on June 14th, 1909. With his death, Nilo Peçanha assumed the Presidency, remaining until November 15th, 1910. He created the EAA as soon as he became President.

His inspiration for creating the EAA was his previous experiences with professional education and similar goals and structures. Among them: the *Asilo de Meninos Desvalidos*[11], in Rio de Janeiro, created in 1874 but inaugurated in 1875 by the Minister of the Empire João Alfredo

[10] Aeronautics Technological Institute

[11] Asylum for Underprivileged Boys

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Correia de Oliveira (Soares, 1981); the three professional schools: Campos, Petrópolis, and Niterói, and the two agricultural schools – Paraíba do Sul and Resende – of Rio de Janeiro, created in 1906 by the President of the State, Nilo Peçanha (Carvalho, 2017); the preliminary draft of the *Congresso de Instrução*[12], held in Rio de Janeiro in December 1906, with conclusions taken to the National Congress, which authorized the government of the Union to promote practical industrial, agricultural, and commercial education in the states and capital of the Republic (Soares, 1981).

In addition to the experiences mentioned, for Cunha (2000a), Nilo Peçanha may also have been inspired by the experiences of the Salesian Fathers when they founded the *Liceu de Artes e Ofícios Santa Rosa*[13], in Niterói, as they arrived in Brazil, in 1883, working in the field of professional education in the trades of mechanics, carpentry, typography, shoe making, and tailoring. Anticlericalism, popular appreciation, and the idea of solidarity among men, principles of Freemasonry, present in the idealization of the EAA (Carvalho, 2017), and the fact that Nilo Peçanha was affiliated with Freemasonry may also have influenced the creation of the EAA (Cunha, 2000a).

Regardless of the motivation, Decree n° 7,566/1909 (Brasil, 1909) created 19 EAA (Brazil, 1909).

> *Considerando que um dos principais deveres do Governo da Republica é interessar-se pela sorte dos menores, principalmente dos desprovidos de meios de vencer a lucta pela existencia, cabendo-lhe portanto amparalos contra qualquer especie de exploração que sobre eles se possa exercer, o Ministerio a meu cargo fez consistir em um dos seus primeiros actos a expedição do decreto n. 7.566, de setembro de 1909, creando nas capitais dos Estados escolas de aprendices, para o ensino profissional e primario gratuito* (Brazil, 1910, p. 135)[14]

The text by Rodolpho Nogueira da Rocha Miranda, Minister of Agriculture, in 1910, is published in the annual report of his Ministry and presented to the President of the Republic of the United States of Brazil. The paternalistic discourse seems protective of the minor, with a concrete interest in helping those who need it. However, there seems to be the creation of a

[12] Education Congress

[13] Santa Rosa School of Arts and Crafts

[14] Considering that one of the primary duties of the Government of the Republic is to take an interest in the fate of minors, especially those who lack the means to overcome the struggle for existence, it is up to them to protect these minors against any exploitation. The Ministry issued Decree nº 7,566 of September 1909 as one of its first acts, creating schools of apprentices for free professional and primary education in the state capitals.

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species of second-rate education behind the genuine and human concern, education for the unlucky, a kind of structural segregation.

Cunha (2000b) sees the creation of the EAA as the first initiative of the positivists within the republican regime to form a labor force in the manufacturing trades. Another ministry, the Ministry of Justice and Domestic Affairs, offered secondary and higher education to resource holders. A theoretical and bachelor's education, for the first, and elementary and practical instruction, for the latter. The fact that the EAA are subordinate to the Ministry of Agriculture is evidence of the form Nilo Peçanha and part of the ruling class of the time thinks of education (Carvalho, 2017), highlighting the separation between one teaching to think and another to do.

According to Manacorda (1989), this division denotes the difference between the secular idea of the formation of men of "ÉPEA" (words), who speak, are cultured, possess material goods and power, and the principles of "ÉRGA" (actions), which form men who only do, produce, and possess nothing. The ÉRGA, the "hands-on", produced the perception of second-class educational institutions and aimed at the most disadvantaged classes (Houghton, 2020) and a stigmatized view (Elias & Scotson, 2000). In contrast, ÉPEA is clothed in the idea of a university with an almost millenary tradition; it is a kind of superior *status*. For Lessa (2005, our translation), this is a misconception, "*a Universidade não é o andaime da educação nacional, e sim seu alicerce. ...*"[15] It is the civilized mode of presence, instead of the bayonet and the dominant currency." (p. A18).

Nevertheless, the Union-funded opportunity was unprecedented for a poor public with no prospect of free job training. However,

> *o que estava em pauta para a maioria das classes dirigentes do nosso início republicano não era, apesar da retórica da maioria e da convicção de alguns poucos dirigentes, uma preocupação com as novas demandas de um mercado de trabalho urbano que se expandia e cuja divisão do trabalho se tornava cada vez mais complexa em função do crescimento industrial e do setor terciário. Era a velha crença elitista de que a educação por si só seria o motor da transformação das classes pobres em cidadãos prontos para a modernidade e ciente dos seus deveres para com a ordem republicana mantida e liderada por elas.* (Carvalho, 2017, pp. 20-21)[16]

[15] the University is not the scaffolding of national education but its foundation.

[16] (…) despite the rhetoric of most and the conviction of a few leaders, what was on the agenda for most of the ruling classes of our republican beginning was not a concern with the new demands of an expanding urban labor

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The noteworthy fact is that Nilo Peçanha instituted primary and free professional education; the EAA represented the place for children deprived of luck to learn the most elementary of formal education: *ler, escrever e contar*[17] (Medeiros Neta et al., 2012, p. 98). The EAAs were created in the context of the increasing population in the municipalities. In 1900, the population recorded in the Statistical Yearbook was 17,418,556 inhabitants (Brazil, 1916).

Article 1 of Decree nº 7,566 of September 23rd, 1909 (Brazil, 1909), states that *em cada uma das capitaes dos Estados da Republica o Governo Federal manterá, por intermedio do Ministerio da Agricultura, Industria e Commercio uma Escola de Aprendizes Artífices, destinada ao ensino profissional primario e gratuito*[18]. In 1909, Brazil was politically divided into 20 states plus the Federal District, which at the time was located in Rio de Janeiro. Despite Decree nº 7,566 establishing that EAAs were created in the capitals of the Republic, the state of Rio Grande do Sul and the Federal District did not have EAAs.

Article 45 of Decree n° 9,070/1911 (Brazil, 1911a) states that "*fica mantido como escola de aprendizes artifices no Rio Grande do Sul o Instituto Technico Profissional da Escola de Engenharia de Porto Alegre, emquanto não fôr estabelecida a escola da União*"[19]. Concerning the Federal District, in the sole paragraph of Article 1 of Decree nº 9,070 (Brazil, 1911a) proposes that "*Será tambem creada no Districto Federal uma escola de aprendizes artifices, logo que o Congresso habilite o Governo com os meios necessarios á sua installação e manutenção*"[20].

The Federal District has never had an EAA. The EAA of the state of Rio de Janeiro was installed in Campos. The President of the state of Rio de Janeiro at the time, Oliveira Botelho, refused to provide the aid requested for installing the school, which led the City Council of Campos to "*oferecer ao Governo federal o prédio necessário, que foi, afinal, aceito the Federal*

market and whose division of labor became increasingly complex due to industrial and tertiary sector growth. It was the old elitist belief that education alone would be the engine of the transformation of the poor classes into citizens ready for modernity and aware of their duties to the republican order maintained and led by them.

[17] Read, write, and count.

[18] the Federal Government will maintain a School of Apprentice Artificers in each of the capitals of the states of the Republic through the Ministry of Agriculture, Industry and Commerce, destined to primary and free professional education.

[19] The Technical Professional Institute of the Porto Alegre School of Engineering is maintained as a school for apprentice craftsmen in Rio Grande do Sul, while the Union school is not established.

[20] A school for apprentice artificers will also be created in the Federal District, as soon as Congress qualifies the Government with the necessary means for its installation and maintenance.

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Government the necessary building, which was, after all, accepted"[21] through Deliberation nº October 14th 13th, 1909, (Soares, 1982, p. 60), giving rise to the EAA of Rio de Janeiro.

Despite the rapid inauguration, the beginning of the first years of operation of the EAA was marked by reported difficulties, such as the lack of buildings, infrastructure, qualified instructors, and school dropouts (Carvalho, 2017).

In 1920, the Ministry of Agriculture, Industry, and Commerce created a commission or service for remodeling professional technical education, whose challenge "*era vencer a falta de professores e mestre qualificados, o mal [sic] aparelhamento das oficinas e a inadequação dos edifícios para uma produção fabril e a oposição de alguns diretores às mudanças*"[22] (Medeiros Neta et al., 2012, p. 100). The commission created a body of inspectors, mostly from the *Escola de Engenharia de Porto Alegre*[23], who took turns directing schools throughout the country. With the intention of "*aprimorar a formação das elites técnicas e a educação industrial do povo... [a comissão] iniciou a tarefa de tradução e elaboração de livros e manuais técnicos*"[24] (Medeiros Neta et al., 2012, p. 100). The EAA received these books.

This commission also made a report known as the *Relatório Lüderitz*[25], which indicated the need for technical education in Brazil to have a national teaching plan for EAAs. The goal was to abandon the artisan tradition and move to master the machine and industrial work in these schools. This report inspired the approval of the *Consolidação dos Dispositivos Concernentes às EAA*[26] by the Ministry of Agriculture, Industry, and Commerce in 1926. There was a two-year increase in the duration of the programs – from four to six years - and the workshops were divided into sections of related trades. Thus, instead of the workshops, there were Woodwork, Metalwork, Leather Arts, Shoemaking, Clothing Manufacturing, and Decorative Arts Sectors, among others. The commission was disbanded in 1931. The Inspetoria de Ensino Profissional Técnico was created in the same year and focused on conducting, guiding, and supervising professional technical education in Brazil (Medeiros Neta et al., 2012).

[21] offer the Federal Government the necessary building, which was, in the end, accepted

[22] was to overcome the lack of qualified teachers and masters, the poor [sic] equipment of the workshops and the unsuitability of the buildings for factory production and the opposition of some directors to the changes

[23] Engineering School of Porto Alegre

[24] improve the training of technical elites and the industrial education of the people... [the commission] began the task of translating and preparing technical books and manuals

[25] Lüderitz Report

[26] Consolidation of Provisions Concerning the EAA

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With the first steps in the direction of the ÉPEA and considering that military schools were never part of a system outside the military sphere, the 19 EAA had the embryo of professional, scientific, and technological education in Brazil, the established of a system still invisible and stigmatized.

A few steps from ÉRGA to ÉPEA and more newcomers

The Vargas Era (1930-1946) experienced the confrontation of habits of regional interest supremacy over the national interest, the attempt to break with the Brazilian 'natural vocation' for primary-export specialization and adherence to the liberal dogmas of self-regulated markets (Saviani Filho, 2013, p. 856). To this end, the State began intervening in the economy and helping society move towards progress. Vargas had an authoritarian but not elitist profile – he was the first President to legitimize his actions at the foundation with the people. He was called a dictator with the Estado Novo (1937-1945) but could not possibly complete the economic, political, and social revolution that began in 1930 without the new attitude. With the Estado Novo, Brazil was characterized by the beginning of a national development project focused on industry (Saviani Filho, 2013).

The Vargas Era saw the creation and change of jurisprudence in all areas, including education. Decree nº 19,402 of November 14th, 1930 (Brasil, 1930), created a Secretariat of State named the Ministry of Education and Public Health. Article 2 assigns education, public health, and hospital care matters to the new Ministry. Article 5 names the public institutions that belong to the new Ministry: the EAA and the *Escola Normal de Artes e Ofícios Wenceslau Braz*[27].

In 1937, before the beginning of the Estado Novo, Law nº 378 of January 13th (Brasil, 1937b) gave a new organization to the Ministry of Education and Public Health. Article 1 of Chapter I assigns a new nomenclature to the Ministry of Education and Public Health, which becomes the Ministry of Education and Health. In Section III, which addresses education services, article 37 states that "*a Escola Normal de Artes e Officios Wenceslão Braz e as EAA , mantidas pela União, serão transformadas em lyceus, destinados ao ensino profissional, de todos os ramos e gráos*"[28].

[27] Wenceslau Braz Normal School of Arts and Crafts

[28] the Wenceslau Braz Normal School of Arts and Crafts and the EAA, maintained by the Union, will be transformed into lyceums, destined for professional education, of all branches and grades

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The *Escola Normal de Artes e Ofícios Wenceslau Braz* had been created in the Federal District by Decree n° 1,880/1917. However, the mayor of the Federal District, Paulo de Frontin, "*alegando os altos custos que essa escola traria à prefeitura, quis fechar a instituição, o que gerou protestos no Rio de Janeiro*"[29] on November 9th, 1918 (Brasil, 2017, p. 11). The impasse came to an end with the donation of the *Escola Normal* to the Federal Government on June 27th, 1919. The School had a fundamental role with the EAA, as "*caracterizou-se por ser a única escola pública voltada para a formação de docentes habilitados a lecionarem nas escolas de aprendizes artífices*"[30] (Brasil, 2017, p. 11).

Although Law nº 378 has transformed the EAA and the *Escola Normal de Artes e Ofícios Wenceslau Braz* into *lyceu*, the term *lyceu* in this school's nomenclature was not found in the searched records. The explanation may be that this school was destroyed and rebuilt in 1937. At that time, it did not operate or even assume the term *lyceu* in the name. The legislation was different when it returned to operation and was renamed the *Escola Técnica Nacional*[31].

The report of the Ministry of Planning and General Coordination in the Sector for Education and Culture (Brasil, 1968) records that "*a referida lei [Lei n° 378/1937] pretendia transformá-la [a Escola Técnica Normal] em Liceu juntamente com as escolas de aprendizes de artífices*"[32] (p. 14). The later nomenclature of the *Escola Técnica Normal* was *Escola Técnica Federal Celso Suckow da Fonseca*[33], through Decree n° 181/1967.

> Como a Escola Normal de Artes e Ofícios Wenceslau Braz, nos moldes em que vinha operando, não atendia satisfatoriamente a essas novas expectativas do capital industrial, o governo federal decidiu pelo fechamento, em 1937, transformando-a, bem como as escolas de aprendizes e artífices existentes no país, em liceus destinados ao ensino técnico em todos os ramos e graus. Derrubado o seu prédio, construíram no mesmo local, a Escola Técnica Nacional, com a filosofia de formar artífices, mestres e técnicos para a indústria nacional, e não mais para preparar docentes e pessoal administrativo voltado para o ensino industrial. (Brasil, 2017, p. 15)[34]

[29] claiming the high costs that this school would bring to the city hall, wishes to close the institution, which led to protests in Rio de Janeiro

[30] was characterized by being the only public school dedicated to the training of qualified teachers to teach in schools for apprentice artificers

[31] National Technical School

[32] the law mentioned above [Law n ° 378/1937] intended to transform it [the Normal Technical School] into a Lyceum along with the schools for apprentice artificers

[33] Celso Suckow da Fonseca Federal Technical School

[34] Because the *Escola Normal de Artes e Ofícios Wenceslau Braz*, in the molds in which it had been operating, did not satisfactorily meet these new expectations of industrial capital, the Federal Government decided to close it in 1937,

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The creation of *lyceus* resulted from the "new expectations of industrial capital", which structured professional education, creating the Division of Industrial Education. In addition, Law nº 378/1937 changed the objectives assigned to the original EAAs since the context of the national industry was new and required qualified people to perform specific jobs with training (Paiva, 2013). This led to a shift from manual and self-employed services to the professional preparation of the workforce for industry, transport, communications, and fishing. Another step in the direction of the ÉPEA was taken.

When giving new organization to the Ministry of Education and Public Health, Article 34 Law nº 378 (Brasil, 1937b) establishes that "*A Universidade do Rio de Janeiro e a Universidade Technica Federal se reunirão para formar a Universidade do Brasil*"[35]. The *Universidade do Brasil*, a result of the merger of 15 schools or colleges, 16 institutes, and the incorporation of the National Museum (Fundação Getulio Vargas. Centro de Pesquisa e Documentação de História Contemporânea do Brasil [FGV CPDOC], 2021), was transformed into the *Universidade Federal do Rio de Janeiro* (UFRJ) in 1965. The *Universidade Technica Federal* is a simple mention in the literature. Even with the denomination "*Technica*" in its genesis and although it had arms of excellence, perfectly shaped with the idea of a network, such as the *Instituto Alberto Luiz Coimbra de Pós-Graduação e Pesquisa de Engenharia* (COPPE), the *Universidade do Brasil* was never mentioned in the system that was taking shape, which denotes the clear distinction, and also the stigma, between ÉPEA and ÉRGA.

Brazil adopted a new Constitution in 1937 (Brasil, 1937a). Article 129 establishes that the Nation, States, and Municipalities must ensure adequate education for children and youth. The text follows with: "*O ensino pré-vocacional profissional destinado às classes menos favorecidas é em matéria de educação o primeiro dever de Estado*"[36]. Professional education continued to refer to the "less favored" classes, as was the focus of the EAAs when created (Rodrigues, 2002).

Another legislation from the Estado Novo affected the original EAA: Decree-Law nº 4,073/1942, called the Organic Law of Industrial Education (Brasil, 1942a). Title III addresses

transforming it and the schools of apprentices and artificers in the country into lyceums destined to technical education in all branches and grades. Having torn down their building, they built the Escola Técnica Nacional in the same place, with the philosophy of training artificers, masters, and technicians for the national industry and no longer preparing teachers and administrative personnel focused on industrial education

[35] The University of Rio de Janeiro and the Federal Technical University will merge to form the University of Brazil

[36] Professional pre-professional education aimed at the less favored classes is, in terms of education, the first duty of the State

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the organization of industrial and technical schools, and Title IV addresses the organization of craft schools and apprenticeships. With this law, the organization of professional education underwent changes so that industrial education was no longer part of primary education since it was equivalent to the secondary level. Still, entry to the higher level could only occur in related careers (Rodrigues, 2002).

The focus became secondary industrial education, which represented an expansion of the education offer – if before it served exclusively primary education, now it has been extended to both.

Decree-Law nº 4,073/1942 prepared the conditions for Decree-Law nº 4,127/1942 (Brasil, 1942b), which "*dispõe sobre as escolas técnicas e as escolas industriais federais, incluídas na administração do Ministério da Educação*"[37] and formalizes the composition of the Federal Network of Industrial Educational Establishments: Technical Schools, Industrial Schools, Artisanal Schools, and Learning Schools. In its article 3, it establishes a national technical school in Rio de Janeiro responsible for training teachers to work in the Network. It should be noted that the National Technical School originates from the *Escola Normal de Artes e Ofícios Wenceslau Braz* (Ciavatta & Silveira, 2010).

The EAA and the *lyceus* from these schools are contemplated in article 8 of Decree-Law nº 4,127/1942 (Brasil, 1942b), which establishes 11 federal technical schools, and in article 9, which establishes 13 federal industrial schools, defining the name of the institutions and the states of the federation that will be implemented. With the Decree-Law, the *lyceus* pass to the condition of Technical School or Industrial School. After over three decades, 19 EAA focused on learning elementary trades became a Network composed of 24 secondary institutions aimed at technical-industrial education. The Network configuration, with *lyceus* located in 20 Brazilian states, emanated from the political organization of society. With the rise of the level of education, from one perspective, the role of the established was set among those who arrived first. Despite some later arrivals, the 19 EAA created in 1909 was the Network.

[37] provides for technical schools and federal industrial schools, included in the administration of the Ministry of Education

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Federal network of industrial educational establishments at the higher level

Brazil had ten Presidents in the Populist Republic (1946-1964), from the 15th, José Linhares (1945-1946) to the 24th, João Goulart (1961-1964). In general terms, the beginning of this period corresponds to the end of World War II. However, from 1942, the economy showed a significant increase in the export of Brazilian products to the world market, including products of high domestic consumption, such as meat and rice; in the domestic market, coffee prices were overvalued (Cano, 2015). In the political sphere, a currency crisis occurred in 1947 because of the anti-inflationary policy, the scarcity of dollars in the post-war period, and the overvaluation of the exchange rate in 1946, among other factors (Cano, 2015; Fontaine, 2020). In 1954, with Brazil immersed in a political and economic crisis, Getúlio Vargas committed suicide. From 1956 to 1961, the country lived an internalization policy, with high public spending and a plan of goals directed by Juscelino Kubitschek (Lafer, 2002).

In the education sphere, Juscelino Kubitschek issued Law nº 3,552/1959 (Brasil, 1959b), which provides for a new school and administrative organization of industrial educational establishments of the Ministry of Education and Culture. Decree nº 47,038/1959 (Brasil, 1959a), which approved the law on the regulation of industrial education, set the tone for industrial education for the economic and social reality of Brazil and clarified that Industrial Education is part of the branch of secondary education. Its article 53 indicates the 23 Federal Schools that should follow the regulations because they comprise the Federal Network of Industrial Educational Establishments of the Ministry of Education and Culture.

The justification for the organization and regulation of industrial education was the adjustment of schools to conform to the new Constitution of 1946 (Rodrigues, 2002).

At the beginning of 1961, Jânio Quadros took over managing the country immersed in debts with the International Monetary Fund. He resigned, after seven months in office. João Goulart took over. The subsequent years were of lack of fiscal controlled, inflation close to 100%, and low economic growth (0.6% in 1963). The scenario for the coup was set. The conservative political groups deposed João Goulart and, in charge of Brazilian politics,

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"*reproduziram por vinte anos uma prática discricionária, autoritária, arbitrária e excludente. Inauguraram e reproduziram o tempo da ditadura no Brasil pós 1964*"[38] (Delgado, 2012, p. 189).

Brazil had seven Presidents and a new economic model during the military dictatorship (1964 – 1985), developmentalist nationalism for the internationalization of the economy (Giorgi & Almeida, 2014). Consequently, educational policies had to conform to the command of the subordination of education to production – in other words, the objectification that had come to factory work was imposed on education via technicist pedagogy.

At this stage, during the administration of Humberto Castelo Branco (1964-1967), Law nº 4,759/1965 once again changed the nomenclature of the originating EAA, providing for the designation and qualification of Federal Technical Schools and Universities. Article 1 states that "*as Universidades e as Escolas Técnicas da União, vinculadas ao Ministério da Educação e Cultura, sediadas nas capitais dos Estados serão qualificadas de federais e terão a denominação do respectivo Estado*"[39] (Brasil, 1965).

The second version of the Law on National Education Guidelines and Basis (LDB, in Portuguese) was signed during the military dictatorship, enacted in 1961, LDB n° 5,692/71 (Brasil, 1971), addressing the reform and professionalization of high school. The world of labor lacked qualified labor to work in industrial development. The school was seen as an institution that should meet the demands of the productive sector. The LDB of 1971 aimed to contain the compulsory and growing demand for education and professionalization. There was an urgent need for mid-level technicians to enter the job immediately, and there were young people who could not or did not aspire to enter the university and could integrate professional training (Giorgi & Almeida, 2014).

In the context of the dictatorship, Law nº 6,545/1978 (Brasil, 1978) was published, transforming the *Escola Técnica Federal do Paraná* into the *Centro Federal de Educação Tecnológica do Paraná* (CEFET-PR), the *Escola Técnica Federal de Minas Gerais* into the *Centro Federal de Educação Tecnológica de Minas Gerais* (CEFET-MG), and the *Escola Técnica Federal Celso Suckow da Fonseca* into the *Centro Federal de Educação Tecnológica de Rio de Janeiro* (CEFET-RJ). Article 2 of the law established that technological education aimed to teach undergraduate and graduate *lato* and

[38] reproduced for twenty years a discretionary, authoritarian, arbitrary, and exclusionary practice. They inaugurated and reproduced the dictatorship period in Brazil after 1964

[39] Universities and Technical Schools of the Union, linked to the Ministry of Education and Culture, headquartered in the capitals of the states will be qualified as federal and will have the name of the respective state

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stricto sensu technical courses (2nd-degree level) at a higher level and continuing education programs and conduct applied research, mainly in industry, in the area of technology. The Network thus reached higher education. Frigotto et al. (2005) affirms that "*o ensino superior nos CEFETs é uma construção histórica e social*"[40] (p. 17) and that the duality present in high school reaches higher education with the CEFETs.

Although the Ministry of Education (MEC) intended to transform the Federal Technical Schools of Bahia, Pernambuco, and São Paulo into CEFET, this decision was not taken (Brasil, 1992). The CEFET of Minas Gerais, Paraná, and Rio de Janeiro, transformed and entered higher education in undergraduate programs, developed since the 1970s, in areas of knowledge specific to the nature of an Institution of the Technological Education System of the Country: Industrial Engineering. At the time, also with a close relationship with the productive sector, higher training Programs for Technologists in sub-areas of technology were implemented. The advance to graduate school was natural and occurred in the three CEFETs, with the implementation of Master's degrees in technological education (Bastos, 2015).

During the period, new changes were imposed by Decree n° 87,310 (Brasil, 1982), which regulated the Law of 1978. Among the changes introduced are higher education as a continuation of 2nd-degree technical education, distinguished from the university education system; the exclusive performance in the technological area; the realization of applied research; and the provision of services.

The CEFETs assume a kind of leadership with the redesign produced by the legal apparatus within the Network (Pilatti, 2017). The system remained without new entrants or changes until 1986.

[40] higher education at CEFETs is a historical and social construction

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The Federal Network of Professional, Scientific and Technological Education is born between advances and setbacks.

In the New Republic (1985-present), Tancredo Neves, elected by direct vote, was not sworn in because he died before. José Sarney, his Vice-President, took over and served as President until 1990. The decade, known in the economic literature as the "lost decade", was marked by economic stabilization plans that aimed to control the inflationary process. The Brazilian economy had high inflation rates and low levels of economic growth. The reversal of the situation began in 1994 with the Real Plan (Ianoni, 2009).

Brazil had another Constitution during this period, the Citizen Constitution of 1988. In the educational field, the *Escola Técnica do Maranhão* was transformed into the *Centro Federal de Educação Tecnológica do Maranhão* (CEFET-MA) by Law nº 7,863/1989 (Brasil, 1989). Without observing technical criteria, the transformation occurred in isolation in the state of origin of then-President José Sarney (Pilatti, 2017). The internalization of CEFETs occurred in the Sarney government, with the Federal Government's program of expansion and improvement of technical education, with the creation of decentralized units within the respective states.

In 1990, the Presidency of Brazil passed to Fernando Collor de Mello, who was removed in 1992 by impeachment. His deputy, Itamar Franco, remained in the Presidency until 1995. During the government of Itamar Franco, Law n° 8,711/1993 (Brasil, 1993b) transformed the *Escola Técnica da Bahia* into the *Centro Federal de Educação Tecnológica da Bahia* (CEFET-BA).

Law nº 6,545/1978 began to govern the five existing CEFETs (MA, BA, PR, MG, and RJ, the latter not originating from an EAA). Other CEFETs were created by Law n° 8,948/1994 in the administration of President Itamar Franco (Brasil, 1994), linked to the Secretariat of Professional and Technological Education (SETEC, in Portuguese). After hearing the National Council of Technological Education, they were gradually implemented by a specific Decree of each centre, obeying what is established by the Ministry of Education and Sports. This law also created the National System of Technological Education, consisting of the five CEFETs, the Federal Technical schools created in 1959, and the Federal Technical and Agrotechnical schools created by Law n° 8,670/1993 (Brasil, 1993a).

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Focusing on the years 1999, 2001, and 2002, during the administration of President Fernando Henrique Cardoso (1995-2003), the specific decrees referred to in Law nº 8,948/1994 for the effective implementation of the new CEFETS were issued without number.

In 1996, the MEC's proposal to reform Professional Education entered the Chamber of Deputies as Bill nº 1,603/1995, processing concomitantly to the Law on National Education Guidelines and Basis (LDB). For political reasons, the Bill was removed from the Chamber of Deputies, "*mas, com a aprovação da LDB 9.394/1996, o antigo projeto que foi 'engavetado', retornou como Decreto 2.208/1997, visando regulamentar a matéria, cujas as [sic] linhas básicas já estavam incorporadas no texto da LDB*"[41] (Ivers, 2000, p. 69). The Professional Education Expansion Program (PROEP, in Portuguese) was created to regulate the guidelines of the LDB (Brasil, 1996) and Decree 2,208/1997 (Brasil, 1997), including three subprojects, one of which made the CEFETs, the Federal Technical Schools, and the Federal Agrotechnical Schools reference centers for the development of professional education in Brazil (Ivers, 2000).

Decree nº 2,208/1997 (Brasil, 1997) altered the structure of CEFETs, especially with the imposition contained in article 5: "*A educação profissional de nível técnico terá organização curricular própria e independente do ensino médio, podendo ser oferecida de forma concomitante ou sequencial a este*"[42]. Regarding the universalization and democratization of secondary education, this decree shows what kind of society was desired at the time since it "*restabeleceu o dualismo entre educação geral e específica, humanista e técnica, destroçando, de forma autoritária, o pouco ensino médio integrado existente no período, mormente da rede CEFET*"[43] (Frigotto, 2018a, p. 50). In practice, the 2nd-degree technical education, a privileged locus of CEFET's performance, could no longer be offered concomitantly with high school.

In the case of CEFET-PR, which at the time was the primary CEFET in Brazil (Pilatti, 2017), a formal meeting took place on December 12th, 1997, with an agenda to create a project to transform the institution into a specialized university (Matos, 2009). Deliberation nº 16/98 of the Board of Directors of CEFET-PR approved the transformation project into a technological university on October 19th, 1998, based on article 52 of the new LDB, which

[41] but with the approval of LDB 9.394/1996, the old project that was 'shelved', returned as Decree 2,208/1997, aiming to regulate the matter, whose [sic] basic lines were already incorporated in the text of the LDB
[42] Professional education at a technical level will have its own curricular organization, independent of secondary education, and may be offered concurrently or sequentially with the first
[43] re-established the dualism between general and specific, humanist and technical education, authoritarianly shattering the little integrated secondary education of the period, especially in the CEFET Network

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provided specialized universities by field of knowledge. Subsequently, the project was summarily refuted by the government of Fernando Henrique Cardoso (Pilatti, 2017). The identity, node of the institution, a social and group identity, according to Elias (1994), was strengthened with the refusal.

Almost concomitantly and with a similar direction but different outlines, the *Escola Federal de Engenharia de Itajubá*, envisioning possibilities opened by the ongoing expansionist policy and the new LDB, also claimed the status of a specialized university in the technological field. In 1998, it went from two to nine new undergraduate programs (Universidade Federal de Itajubá [UNIFEI], 2021). In 2002, President Fernando Henrique Cardoso sanctioned the project to transform the *Escola Federal de Engenharia de Itajubá* into a university. However, the *Universidade Federal de Itajubá* (UNIFEI) was created without the specialized condition, even maintaining the focus on engineering programs (UNIFEI, 2021). The university was born as traditional, with no link to SETEC.

On November 14th, 2002, the Joint Normative Instruction (INC, in Portuguese) 3,679 (Brasil, 2002) suggested to the Ministry of Education the accreditation of CEFET-PR, CEFET-RJ, and CEFET-MG in universities specialized in the technological field. However, the accreditation did not occur.

Luiz Inácio Lula da Silva was President of Brazil from 2003 to 2011. On November 5th, 2003, INC 1,135 (Brasil, 2003) was filed, proposing studies to define and standardize criteria and conditions for CEFET to become a technological university. INC 2,571 of April 19th, 2004 (Brasil, 2004a), suggested to the Ministry of Education the transformation of CEFETS into technological universities without specifying which one. On September 28th, 2004, Bill nº 4,183 began processing (Brasil, 2004b), which provides for transforming CEFET-PR into a technological university. Other INCS were filed in sequence, having in common the request for transforming a specific CEFET into a technological university (Pilatti, 2017).

With the systematic expansion of the *Sistema Nacional de Educação Tecnológica*[44], a new organization for CEFET was established with Decree nº 5,224 (Brasil, 2004c), which allocates, for the first time, institutions in the field of technological education.

[44] National System of Technological Education

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Of the requests to transform CEFET into a technological university, Bill nº 4,183, which became Law nº 11,184/2005 (Brasil, 2005), came into fruition and transformed CEFET-PR into UTFPR. Despite indicators similar to those of CEFET Minas Gerais and Rio de Janeiro, the institution from Paraná was the only one whose university indicators were established by the legislation of the time.

Inspired by the example of CEFET-PR, most CEFETs, even without indicators, filed requests for transforming into a university through parliamentarians. The most robust movements concerning academic indicators and importance within the system were those of CEFET-MG and CEFET-RJ. The strong political pressure of the CEFETS, in some way, produced Decree nº 6,905/2007 (Brasil, 2007) and the Public Call 2 (December 2007), which allowed the CEFETs to send proposals for transformations into FI until March 31st, 2008 (Pilatti, 2017).

In 2008, Law nº 11,892 of December 29th (Brasil, 2008), established the Federal Network of Professional, Scientific, and Technological Education. The Network aimed "*ministrar educação profissional técnica de nível médio, prioritariamente na forma de cursos integrados, para os concluintes do ensino fundamental e para o público da educação de jovens e adultos*"[45] (Section I, art. 5, I). Thirty-eight FI were created. It should be noted that many of these institutes have campuses, expanding the education points in Brazil, and that "*o status de universidade dos IF foi uma solução negociada para impedir que grande parte dos CEFETs pressionassem politicamente*"[46] (Frigotto, 2018B, p. 130) on the government so that they all become universities. In practice, more than a decade after the creation of the Network, FIs have a network identity only in the legal and administrative aspects, which differs greatly from the network identity established by federal technical schools or CEFETs. Among the reasons that justify this lack of network identity is the very configuration of the institutes - varied, with many campuses in a wide physical space; verticality with a diversity of focuses: technical high school, integrated high school, PROEJA in the technical and integrated modalities, PRONATEC, licenciature, graduate studies, and extension degrees; and lack of stimulation and collaboration of the MEC with this identity: it receives the rectors of the FIs in isolation - and not collectively–, to address specific issues (Frigotto, 2018b).

[45] to provide secondary-level technical professional education, primarily in the form of integrated programs, for elementary school graduates and youth and adult education audiences

[46] the university status of the FI was a negotiated solution to prevent a large part of the CEFETs from exerting political pressure

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In addition to the 38 FIs created, the Network includes UTFPR, CEFET-MG, CEFET-RJ, and technical schools linked to Federal Universities. In 2012, *Colégio Pedro II*, located in Rio de Janeiro, was incorporated.

Among the institutions belonging to the Network is the 19 originating EAA founded in 1909, 17 of which were transformed FI in isolation, by agglutination of institutions, or by joining municipalities. CEFET-MG maintains the nomenclature assigned by Law n° 6,545/1978 (Brasil, 1978) and the UTFPR by Law n° 11,184/2005 (Brasil, 2005). CEFET-RJ is part of the Network. The distinction between established and *outsiders* became patent concerning space. Large and small CEFETs coexisted in the same space (Pilatti, 2017).

In the view of Elias and Scotson (2000), to maintain the desired recognition, the members of the higher (established) groups become hostages of their role of identification and group integration to preserve the greater value of their group. This preservation is incompatible, to some extent, with the transformation into a technological university.

The UTFPR initially remained linked to the Secretariat of Technological Education (SETEC) and the other CEFETs. The link was inconsistent with the university system and soon became untenable. The incongruence was in the university autonomy, present in the UTFPR and nonexistent in the FIs. With autonomy, UTFPR maintained its performance at the undergraduate and graduate levels in opposition to the educational policies determined by the MEC.

UTFPR differed within the Network. The tension did not arise from the perversity of one or the other, but from belonging to antagonistic positions. Such positions are common factors where mobility, in the case of the Network towards the ÉPEA, is claimed. The shift from UTFPR to the Secretariat of Higher Education (SESu) was simple. The same does not occur for CEFET-MG and CEFET-RJ, which are in SETEC without accepting the condition of FI since "*a engenharia política de criação dos IF resulta mais de um arranjo político do que de resultado da pertinência social e educacional da inusitada nova institucionalidade que abriga uma verticalidade de ofertas de níveis e modalidades de formação*"[47] (Frigotto, 2018B, p. 132). CEFETs continue to seek the status of a technological university and consequent change of logic (Ciavatta, 2006). Within the

[47] the political engineering of creating the FI results more from a political arrangement than from the result of the social and educational relevance of the unusual new institutionality that houses a verticality of offers of levels and training modalities

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National Council of Institutions of the Federal Network of Scientific and Technological Professional Education (CONIF), with 41 congregated institutions, there is latent tension between opening the possibility for new technological universities, desired mainly by the established ones, and the stigma for not wanting to belong to them.

The CEFETs that became FI had a setback in the level of performance. Law nº 11,892/2008 (Brasil, 2008) makes it clear in the institution objectives that "*no desenvolvimento de sua ação acadêmica, o Instituto Federal, em cada exercício, deverá garantir o mínimo de 50% (cinquenta por cento) de suas vagas para atender aos objetivos*"[48] (Art. 8) of "*ministrar educação profissional técnica de nível médio, prioritariamente na forma de cursos integrados, para os concluintes do ensino fundamental e para o público da educação de jovens e adultos*"[49] (Art. 7, item I). However, according to Frigotto (2018A), in ten years, "*os dados da pesquisa indicam, especialmente nas instituições matrizes dos campi, os antigos CEFET, que o ensino médio só continua por força da obrigatoriedade da lei e a ênfase ... não é o médio integrado*"[50] (p. 50).

It is a fact that the UTFPR was not a government project, much less a state project (Pilatti, 2017). The transformation was political and produced multiple cascading demands in the same sphere. According to Elias (2000), a knot was established between psychogeny and sociogeny. To prevent the dismantling of the federal system aimed at secondary-level technical training, Decree nº 6,905 (Brasil, 2007) was produced. With the non-pacification of the system, visible in the CEFET lawsuits, the government seeks to establish new measures of confrontation.

One of the manifest forms is Bill n° 1,453 (Brasil, 2021), which is processing in the Chamber of Deputies. The Bill proposes to raise the minimum from 50 to 75% of the offer of vacancies in technical professional education programs of medium level and the removal of UTFPR from the Network. A possible approval of the Bill that has government support will produce two primary developments: the return of the action axis of the Network members to

[48] in the development of its academic activities, the Federal Institute, in each fiscal year, must guarantee a minimum of 50% (fifty percent) of its vacancies to meet the objectives

[49] provide secondary-level technical professional education, primarily in the form of integrated programs, for elementary school graduates and youth and adult education audiences

[50] research data indicate, especially in the primary institutions of the campuses, the former CEFET, that secondary education only continues by force of law and the emphasis ... it is not integrated secondary education

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the secondary level and, in practice, the unfeasibility for future lawsuits of technological universities.

Final Remarks

Reconstructing the history of Brazilian technological education produced a verifiable model, given that the directional character of the process is among the universals of the knowledge process. Two directions, polar and complementary, are always together. Progress in both directions may follow one another or exist simultaneously in uniform and variable adjustments. Knowledge is lost as much as it is acquired. The verifiable directional character is one of advance relative to the starting point. The advance in the story told was the removal of the "hands-on" to higher levels of education.

The Federal Network of Professional and Technological Education originated in 1909 when 19 EAA were created. Education was offered with workshops and intended for minors "deprived of luck". The first of successive transformations took place in 1937, always to meet the political demands of an industrializing country. Raising the level of education to meet the increasing complexity of industry is common. If the EAA of 1909 offered trades, the current network is formed by institutions that offer higher education. The inflection point in the network occurs with the transformation of CEFET-PR into the first technological university in Brazil. After the transformation, the policies adopted by the MEC indicate a return of the education axis to the secondary level.

As living and pulsating, the Network was built between the stigma of offering a species of second-class education aimed at the most disadvantaged classes (ÉRGA) and the search for a superior *status* (ÉPEA). The internal conflict, which generates tensions, resides in the intention of the established, although not solely, to achieve objectives that are outside the Network. Everyone with the choice of a superior *status* chose it. The constituted system has become more unified and integrated.

The differences between the established and the *outsiders* are in the power and self-image of superiority. The time remaining in the setting is distinctive. As is the identity. The case of UTFPR is emblematic of a space surrounded by tensions, with many observable fragments.

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