

Políticas e desafios da educação profissional: uma análise comparativa entre Brasil, Estados Unidos e Costa Rica

Policies and challenges in vocational education: a comparative analysis of Brazil, the United States, and Costa Rica

Políticas y Desafíos de la Educación Profesional: Un Análisis Comparativo entre Brasil, Estados Unidos y Costa Rica

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Received: September 08, 2025

Accepted: November 18, 2025

Published: March 16, 2026

RESUMO

Este artigo analisa comparativamente as políticas e os desafios da educação profissional no Brasil, nos Estados Unidos e na Costa Rica, destacando convergências e divergências entre os três contextos. O objetivo é compreender como esses países estruturam a educação profissional em resposta às transformações do mundo do trabalho, à integração curricular e às demandas socioeconômicas contemporâneas. O estudo adota abordagem qualitativa, de caráter descritivo e comparativo, fundamentada em revisão bibliográfica e documental. Foram utilizadas legislações nacionais, relatórios de organismos internacionais (UNESCO e OCDE), artigos científicos e documentos oficiais de órgãos governamentais. Os resultados apontam que o Brasil apresenta avanços normativos com a proposta de integração entre ensino médio e formação técnica, mas ainda enfrenta dificuldades de implementação e valorização docente. Os Estados Unidos consolidam um modelo flexível e fortemente vinculado ao setor produtivo, sustentado por maior valorização da carreira docente, embora marcado por desigualdades de acesso. A Costa Rica destaca-se por iniciativas inclusivas e comunitárias, mas enfrenta tensões entre pressões internacionais e necessidades locais. Conclui-se que não há modelo único de sucesso em educação profissional, mas diferentes caminhos que refletem realidades históricas, culturais e socioeconômicas. Para o Brasil, o estudo sugere a necessidade de fortalecer a integração entre teoria e prática, valorizar a carreira docente e ampliar a articulação com o setor produtivo, sem abrir mão de políticas inclusivas e contextualizadas.

Palavras-chave: Educação comparada; Políticas educacionais; Educação Profissional e Tecnológica; Formação para o trabalho.

ABSTRACT

This article provides a comparative analysis of vocational education policies and challenges in Brazil, the United States, and Costa Rica, highlighting both convergences and divergences across the three contexts. The aim is to examine how these countries structure vocational education in response to transformations in the world of work, curricular integration, and contemporary socioeconomic demands. The study adopts a qualitative, descriptive, and comparative approach, grounded in a review of academic literature and official documents. Sources include national legislation, reports from international organizations (UNESCO and OECD), peer-reviewed articles, and government documents. The findings indicate that Brazil has made normative advances through the integration of secondary education and technical training, but continues to face challenges in implementation and teacher professional recognition. The United States has consolidated a flexible model closely linked to the productive sector, supported by greater recognition of the teaching profession, although persistent inequalities in access remain. Costa Rica stands out for inclusive and community-based initiatives, but faces tensions between international pressures and local needs. The study concludes that there is no single successful model for vocational education; instead, diverse approaches reflect historical, cultural, and socioeconomic realities. For Brazil, the analysis suggests the importance of strengthening the integration of theory and practice, enhancing the value of the teaching profession, and expanding partnerships with the productive sector, while maintaining inclusive and context-sensitive.

Keywords: Comparative Education; Educational Policies; Vocational and Technological Education; Workforce Training.

RESUMEN

Este artículo analiza comparativamente las políticas y los desafíos de la educación profesional en Brasil, Estados Unidos y Costa Rica, destacando convergencias y divergencias entre los tres contextos. El objetivo es examinar cómo estos países estructuran la educación profesional en respuesta a las transformaciones del mundo del trabajo, a la integración curricular y a las demandas socioeconómicas contemporáneas. El estudio adopta un enfoque cualitativo, de carácter descriptivo y comparativo, fundamentado en revisión bibliográfica y documental. Se utilizaron legislaciones nacionales, informes de organismos internacionales (UNESCO y OCDE), artículos científicos y documentos oficiales de entidades gubernamentales. Los resultados muestran que Brasil presenta avances normativos con la propuesta de integración entre la educación secundaria y la formación técnica, pero aún enfrenta dificultades de implementación y de valorización docente. Estados Unidos consolida un modelo flexible y fuertemente vinculado al sector productivo, sostenido por una mayor valorización de la carrera docente, aunque marcado por

desigualdades de acceso. Costa Rica se destaca por iniciativas inclusivas y comunitarias, pero enfrenta tensiones entre presiones internacionales y necesidades locales. Se concluye que no existe un modelo único de éxito en educación profesional, sino diferentes caminos que reflejan realidades históricas, culturales y socioeconómicas. Para Brasil, el estudio sugiere la necesidad de fortalecer la integración entre teoría y práctica, valorar la carrera docente y ampliar la articulación con el sector productivo, sin renunciar a políticas inclusivas y contextualizadas.

Palabras clave: Educación Comparada; Políticas Educativas; Educación Profesional y Tecnológica; Formación para el Trabajo.

Introduction

Within the contemporary global context, the relationship between education and employability has emerged as one of the central challenges of public policy. Rapid technological and economic transformations demand the constant updating of skills, intensifying the debate over how educational policies are preparing young people for an environment in permanent change. Against this backdrop, different countries have sought to align their vocational education systems with the contemporary needs of the labor market. However, the models adopted vary according to specific historical, social, and cultural contexts.

Vocational education has been recognized as a strategic element for economic and social development, insofar as it contributes to the insertion of individuals in the world of work and to the qualification of the labor force in contexts of rapid technological and productive transformations (Mota, 2011; Frigotto; Ciavatta; Ramos, 2005). In this context, authors such as Freire, Verona, and Batista (2018) highlight that Professional and Technological Education (*Educação Profissional e Tecnológica* – EPT) also incorporates cultural, aesthetic, and sociotechnical dimensions, reinforcing its formative potential. The metamorphoses associated with the advent of globalization and the transition from a Fordist to a post-Fordist paradigm demand new competencies, such as adaptability, creativity, and mastery of digital technologies, making the revision of curricula and educational practices imperative (Schwartzman; Castro, 2013).

According to Silva and Coutinho (2024), EPT represents a necessary response to the demands of Industry 4.0 and the digitalization of the economy, contributing both to the qualification of professionals and to social inclusion and economic mobility. The authors also emphasize the importance of articulating basic education with professional training, arguing that this integration strengthens the preparation of students for qualified occupations and promotes greater equity in access to labor opportunities.

In Brazil, the integration of secondary education and technical training was established by normative frameworks such as the National Education Guidelines and Framework Law (*Lei de Diretrizes e Bases da Educação Nacional* – LDB) of 1996 and Law No. 11,892/2008, but its implementation still faces structural challenges. In the United States, a flexible and pragmatic model predominates, marked by direct

articulation between schools and the productive sector, while Costa Rica stands out for inclusive initiatives, with strong community participation and ties to the productive sector.

The present study seeks to understand to what extent these three countries — Brazil, the United States, and Costa Rica — converge or diverge in their vocational education policies, considering the formation of citizens and workers in the 21st century. The study has the following objectives: (i) to analyze the impact of vocational education on the labor market and on skills development; (ii) to investigate how vocational education is conducted in the three contexts; (iii) to identify public policies and their relationships with economic development; and (iv) to compare convergences and divergences in order to reflect on possible improvements in the Brazilian scenario.

This article seeks to fill a gap by systematically comparing Brazil, the United States, and Costa Rica under the same analytical framework, bringing in Costa Rica — little explored in Brazilian literature — as a Latin American counterpoint. The contribution is twofold: (i) it synthesizes policy mechanisms that help to explain differences in design and implementation; and (ii) it presents a replicable comparative framework for future analyses in regional contexts.

By offering a comparative analysis, this study aims not only to map national specificities, but also to dialogue with broader international trends, situating the Brazilian debate within a global context. The expectation is thus to contribute both to academic production and to the formulation of public policies that combine quality, inclusion, and social relevance.

Theoretical Framework

Transformations of work and the centrality of education

The technological and productive transformations that characterize the post-Fordist era have entailed a profound reconfiguration of the dynamics between capital and labor. The Fordist model, based on standardized and centralized production, gave way to flexible and decentralized forms of productive organization, demanding from workers not only technical knowledge, but also skills of adaptation, problem-solving, and the use of digital technologies (Frigotto; Ciavatta; Ramos, 2005).

In this context, the school takes on a decisive role as a space for the production and reproduction of knowledge, values, and attitudes, functioning simultaneously as a *locus* of formation and of legitimation of the new demands of the labor market (Mota, 2011). Vocational education, therefore, becomes an essential vector of mediation between global economic transformations and the preparation of citizens capable of acting in complex and interdependent societies.

Within the contemporary global context, the relationship between education and employability has gained prominence as one of the main challenges of public policy. Rapid technological and economic transformations demand the constant updating of competencies, intensifying the debate over how educational policies are preparing

young people for this dynamic scenario.

Beyond technological and productive changes, it is necessary to recognize that the school operates not only as a space for the formation of competencies, but also as an instance of social reproduction. As Ciavatta (2014) emphasizes, the school institution is responsible for the dissemination of values, ideologies, and knowledge that legitimize the prevailing mode of production. Thus, the understanding of vocational education must include its dual function: preparing for work and, at the same time, reinforcing or questioning broader social structures.

In sum, the literature points out that the contemporary challenge is not restricted to training qualified labor, but to articulating educational processes that enable a critical understanding of the transformations of work and their social implications. This perspective broadens the role of the school, which must be analyzed as an institution that forms and, at the same time, reproduces inequalities.

Conceptions of vocational education

The specialized literature presents different conceptions regarding the role of vocational education. While some approaches emphasize its instrumental function of directly meeting the demands of the productive sector, other authors advocate a more integral and critical formation.

According to Schwartzman (2016), drawing on the writings of Antonio Gramsci from the 1920s, some Marxist authors criticize the idea that technical education should prioritize only the preparation of professionals for the labor market, arguing that this would reinforce class divisions and prove alienating. By contrast, they defend an integral education that breaks the dichotomy between manual and intellectual labor, providing students with solid scientific and cultural knowledge. In this sense, Saviani (2007, p. 161) introduces the concept of "*politecnia*" (polytechnic education), defined as specialization associated with the mastery of the scientific foundations of the various techniques used in modern production.

In Brazil, this debate is expressed especially in the notion of integrated secondary education, which seeks a unitary articulation between general and professional formation (Vieira; Vieira, 2016; Brazil, 2007; Moura, 2007; Frigotto; Ciavatta; Ramos, 2005). Bessa et al. (2020) reinforce that integration must be understood as interdisciplinarity between general and specific knowledge, broadening students' worldview and enabling a critical understanding of reality. In this sense, integrated formation is not reduced to the coexistence of distinct contents, but proposes a continuous articulation between theory and practice, fostering contextualized and socially meaningful learning.

Professional and technological education in Brazil and Integrated Secondary Education (*Ensino Médio Integrado* – EMI) are interconnected through the attempt to promote a more complete formation that encompasses both the academic development and the technical qualification of students.

In the early 2000s, a new milestone was established with Decree No. 5,154 of

2004, which restored the integration of technical vocational education at the secondary level with general secondary education. This decree allowed for the offering of integrated courses in three forms: integrated, concurrent, and subsequent, seeking to overcome the dichotomy between training for manual labor and intellectual development.

Thus, the contemporary conception of vocational education cannot be restricted to responding to the immediate demands of the productive sector, but must promote an omnilateral formation, capable of articulating theory and practice, general culture and technical knowledge, in order to prepare critical subjects, able to understand and transform the social reality in which they are embedded.

Methodology

This study is characterized as qualitative research of a descriptive and comparative nature, grounded in bibliographic and documentary review. The methodological objective was to analyze the policies and challenges of vocational education in Brazil, the United States, and Costa Rica, identifying convergences, divergences, and implications for the Brazilian context.

Foundations of the comparative approach

Comparison between educational systems requires foundations specific to Comparative Education, understood as a field that seeks to identify similarities, differences, and particularities between educational policies and practices in different contexts. Bonitatibus (1989) emphasizes that this process depends on previously defined categories and clear criteria of analysis, avoiding impressionistic descriptions and ensuring methodological rigor. In this sense, Bray, Adamson, and Mason (2015) stress the importance of making explicit the units of analysis and levels of comparison as a condition for consistent interpretations.

Nóvoa (1998) adds that decontextualized comparisons may produce illusory readings of educational models, reinforcing the need to consider the historical trajectories and sociopolitical conditioning factors of each country. From a contemporary perspective, Bartlett and Vavrus (2017) propose understanding comparison as a relational and multiscalar process, articulating local, national, and global influences.

Based on these references, this study organized the comparison among the three countries around three previously defined dimensions: (i) legal frameworks and vocational education policies; (ii) curricular models and forms of integration between general and technical formation; and (iii) connections between school and the labor market. These dimensions guided the comparison among the three countries analyzed, ensuring methodological coherence and dialogue with the foundations of Comparative Education.

Data sources

National legislation was consulted (such as the National Education Guidelines and Framework Law and its complementary provisions), reports from international organizations — particularly the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Organisation for Economic Co-operation and Development (OECD) —, as well as scientific articles indexed in academic databases. Official documents from government agencies and technical reports from research institutions were also considered, with a view to strengthening the robustness of the evidence analyzed.

The selection of sources considered three main criteria: (i) thematic relevance, referring to direct pertinence to professional and technological education; (ii) currency, with preference for publications after 2000, without disregarding essential classical texts; and (iii) pertinence, related to the explicit connection with the objectives of analyzing policies, legal frameworks, curricular models, and socioeconomic impacts.

Additionally, studies published in the last 15 years were prioritized, ensuring dialogue with contemporary debates, without excluding structuring theoretical references in the field. Documentary and bibliographic searches covered the period from 2000 to 2025, with emphasis on the last 15 years, using combined strings (e.g., "vocational education" OR "Technical and Vocational Education and Training" (TVET) AND [Brazil/United States/Costa Rica]; "upper secondary" AND "work-based learning"; "integração ensino médio técnico"). Official pages of ministries and agencies were examined, as well as repositories such as Scopus, Web of Science, and SciELO, in order to triangulate legislation, reports, and peer-reviewed articles.

The variety of these sources allowed for the organization of the comparison among the countries according to the analytical dimensions defined in the comparative approach.

Analysis procedures

The method of thematic comparison was adopted, organized around the three analytical axes previously described: legal frameworks and vocational education policies; curricular models and formative modalities; and connections between school and the labor market. These axes were defined a priori and derive from the dimensions established in the comparative framework, in line with Bonitatibus (1989) and Bray, Adamson, and Mason (2015), who recommend clear categories for comparative analyses.

Educational policies and legal frameworks of vocational education; Models of curricular integration and formative modalities; Socioeconomic impacts and labor market insertion.

The analysis sought to identify patterns, convergences, and differences among the three countries, articulating them with the global transformations of work and contemporary demands for qualification. The data were systematized descriptively and comparatively, prioritizing clarity in the organization of information and consistency in

the interpretation of the findings.

Justification for the choice of countries

The selection of Brazil, the United States, and Costa Rica is due to their representativeness in the American continent. Brazil, as a large developing country, with a consolidated federal network of vocational education; the United States, as an international reference in flexibility and formative diversification; and Costa Rica, for representing Central America and integrating the group of emerging Latin American countries highlighted by the OECD (2021), whose experiences offer relevant elements for the Brazilian debate. This choice also sought to encompass different socioeconomic realities and institutional models, in order to enrich the comparative analysis and broaden the validity of the inferences drawn.

Results

Brazil

Integrated education in Brazil represents an innovative modality of vocational education, as provided for in the LDB. This educational approach, set out in Article 36C of the LDB, proposes an integration between secondary education and professional training, establishing a single course for students, with unified enrollment and certification. The legislation determines that vocational education must occur in articulation with secondary education, and this articulation may take two forms: integrated and concurrent (Brazil, 1996).

In the integrated form, this modality is made available exclusively to graduates of primary education. The course is structured to train the student in a technical professional qualification, simultaneously with the secondary level of education. Both courses are taught at the same educational institution, promoting deeper integration between academic and vocational content. Notably, the student completes a single enrollment for the course, simplifying the administrative process (Belther, 2013).

On the other hand, in the concurrent form, integrated education is offered to those who are already attending secondary education. In this case, the articulation between vocational education and secondary education may occur at the same educational institution or at different institutions. Students who choose this modality maintain two distinct enrollments, one for each course, allowing flexibility in the choice of educational institutions and in the structuring of their academic and professional trajectories (Belther, 2013).

The integrated education approach, as outlined by Vieira and Vieira (2016) in the Brazilian context, is grounded in the intrinsic conception of the inseparability between general and professional education. From this perspective, integrated formation presupposes not merely a coexistence, but a profound integration across epistemological domains, contents, methodologies, and educational practices.

Bessa et al. (2020) emphasize that integration, in the context of integrated

education, refers to the interrelation or interdisciplinarity between general and specific contents of vocational education, encompassing various teaching modalities. This interaction demands a continuous construction of the relationship between general and specific knowledge throughout the subject's formation. More than that, such integration is expected to provide individuals with an understanding of reality beyond its phenomenal manifestation. This implies the application of effective strategies and methodologies that facilitate the appropriation and application of acquired knowledge, transcending the apparent surface of phenomena.

However, the Brazilian case demonstrates consistent normative advances and an innovative proposal for curricular integration. Nevertheless, the challenges of implementation and regional inequality still compromise its effectiveness, revealing a significant gap between legal frameworks and the everyday practice of institutions.

According to Oliveira (2024), administrators often do not fully grasp the proposal of integration between secondary education and vocational education, which results in difficulties in effectively implementing the integrated curriculum. "Even though the defense of an integral formation existed in the course plans and in the political-pedagogical project, this did not imply that its principles were clear to administrators and teachers" (Oliveira, 2024, p. 9).

United States

The basic educational system of the United States is structured over 12 years, comprising grades 1 through 12, prior to entry into higher education. This cycle encompasses the equivalent of primary and secondary education in Brazil, providing a solid and comprehensive educational foundation. In the first six years, students attend Elementary School (grades 1 to 6). They then move on to Middle School (grades 7 and 8), equivalent to the final years of Brazilian primary education. Finally, High School (grades 9 to 12) corresponds to secondary education, where students have greater autonomy in choosing subjects aligned with their academic and professional interests and aspirations (Peralta; Dias; Gonçalves, 2018; Gordon, 2014; Gray, 2004).

In High School, in addition to the curricular flexibility already mentioned, there is an expansion of formative opportunities linked to technical and vocational education. At this level, schools and districts offer specific pathways — such as technical careers, work preparation programs, and professional certifications — that articulate academic content with practical competencies, reinforcing the connection between school education and labor market insertion (Peralta; Dias; Gonçalves, 2018; Dortch, 2018).

Technical and vocational education is organized at different levels within the system, providing multiple options of formative itineraries. A first level occurs in the so-called comprehensive high schools, which integrate academic disciplines with technical and vocational courses. In these institutions, students can study areas such as family and consumer sciences, mechanics, repairs and services, combining general education with the development of specific skills (Amorim; Schwartzman, 2014).

After the completion of secondary education, a transition period of up to two years opens up. At this stage, students can choose among four main pathways, which

are not mutually exclusive and may be combined:

1. Four-year academic careers, oriented toward traditional theoretical formation;
2. Two-year technical and vocational careers, aimed at rapid and practical insertion in the labor market;
3. Short-term professional certifications (less than two years), specific to specialized and high-demand functions;
4. Four-year technical-vocational careers, which balance theory and practice, preparing students for more complex positions in the market.

This tiered structure gives the U.S. system a highly flexible character, allowing each student to design a personalized trajectory according to their academic and professional expectations. At the same time, this model reflects the U.S. cultural emphasis on immediate employability and adequacy to market demands, a characteristic that strengthens labor market insertion but may also deepen social and racial inequalities. More vulnerable groups tend to concentrate in short-term technical pathways, while segments with greater economic and cultural capital predominate in prestigious academic tracks, revealing tensions between the promise of equal opportunity and the reality of the system (Amorim; Schwartzman, 2014; Dortch, 2018).

Thus, the U.S. case demonstrates a pragmatic, decentralized, and diversified model, in which technical and vocational education plays a central role in the school-to-work transition. The breadth of choices and the integration with the productive sector emerge as strengths, but the limitations associated with structural inequalities remain a recurrent challenge for the consolidation of a truly equitable system.

Costa Rica

In Costa Rica, basic general education is organized into three compulsory cycles: the first two correspond to the primary level (ISCED 1) and the third to lower secondary (ISCED 2). This structure guarantees universal access, since participation in all cycles is compulsory (UNESCO, 2019). In addition, the country adopts second-chance policies, with emphasis on evening education, intended for adolescents and adults aged 15 or over who have not completed schooling at the regular age. This modality plays a significant role in ensuring alternative and more flexible educational trajectories.

Complementarily, the system offers self-directed learning options through initiatives such as the Professional Institutes of Community Education (*Institutos Profesionales de Educación Comunitaria* – IPEC), the Integrated Center for Adult Education (*Centro Integrado de Educación de Adultos* – CINDEA), and the Primary and Secondary Education Program by Proficiency (*Primaria y secundaria por suficiencia*), which allow for the certification of knowledge acquired outside the traditional school setting (UNESCO, 2019; Morales-López, 2017). These mechanisms reinforce the logic of inclusion and diversity of pathways, broadening access and reducing inequalities.

One of the most distinctive elements of the Costa Rican model is *educación diversificada* (diversified education), offered to students between 15 and 16 years of age, which marks the transition between basic education and more specialized formative choices. This program is organized into three main tracks:

1. Academic, oriented toward theoretical deepening and preparation for higher education, with emphasis on careers in research and scientific investigation;
2. Technical, focused on the development of practical and specific skills for different professions, with an emphasis on meeting labor market demands and strengthening the qualified workforce in strategic sectors of the economy;
3. Artistic, geared toward the development of creative and cultural competencies, offering training in music, visual arts, theater, and dance, which reinforces the appreciation of the diversity of talents (UNESCO, 2019).

In addition to these pathways, complementary programs such as the *Bachillerato por Madurez Suficiente* and *Nuevas Oportunidades* (High School Diploma for Mature Students and New Opportunities) offer alternatives for completing schooling through certifications, distance courses, and more flexible learning formats, which adapt to students' individual needs (UNESCO, 2019; Morales-López, 2017).

Regarding technical and professional education, it is part of the diversified education stage but also extends to higher education and to the non-formal sphere, being offered by both public and private institutions. Most state-led initiatives concentrate on the IPECs, which articulate technical formation with community and local demands. A relevant aspect is that technical and professional education, in the Costa Rican model, is not directly incorporated into secondary education as in Brazil but rather linked to the diversification of the final stage of compulsory education (UNESCO, 2019).

This arrangement demonstrates the inclusive and community-based character of the Costa Rican system, which offers multiple alternatives for access, certification, and continuity of studies. At the same time, it reveals a structural tension: on the one hand, international pressures — especially from bodies such as the OECD — that encourage greater alignment with global market demands; on the other, local needs for inclusion and equity, which sustain the country's communitarian and participatory tradition in education (Camacho Calvo, 2023).

The Costa Rican model demonstrates a strong articulation between social inclusion and vocational training, sustained by community mechanisms and mandatory internships. However, it faces tensions between meeting the pressures of international organizations and preserving contextualized and equitable policies at the local level.

Discussion

The comparative analysis among Brazil, the United States, and Costa Rica shows that, although the three countries recognize the importance of vocational education for socioeconomic development, their strategies differ significantly. This reading is grounded in authors and international organizations, which make it possible

to understand how each educational system responds to the demands of the labor market in specific contexts.

In Brazil, the integration of secondary education and technical training was conceived as an innovative milestone, especially after the LDB (1996) and Law No. 11,892/2008. Souza and Santos (2021) emphasize that overcoming the fragmentation between general and technical formation represents a normative advance, but its implementation still faces practical difficulties. This mismatch is reflected in worrying indicators: according to the OECD (2020), the country is among those with the highest percentage of NEET (Not in Employment, Education or Training) youth, a situation also associated with low performance in reading, mathematics, and science measured by the Programme for International Student Assessment (PISA), a comparative test administered by the OECD to 15-year-old students.

Another critical point refers to the recognition of the teaching profession. Although Law No. 11,738/2008 instituted the national minimum wage, in 2018 five states still did not fully comply with it, and the salary gap between teachers and other occupations with the same level of schooling reached 13%, while in OECD countries this differential was only 7% (DIEESE, 2019). These elements weaken the effectiveness of vocational education policies.

Comparative studies by the OECD (2018) show that countries such as Chile and Mexico also face similar dilemmas, in which normative advances do not fully translate into effective practices, especially due to structural inequalities. In this regard, Kuenzer (2019) emphasizes that, in Latin America, the low attractiveness of the teaching career and the difficulty of implementing educational policies compromise the consolidation of vocational education, even in the face of legal frameworks considered advanced.

In the United States, vocational education has historically been shaped by its direct linkage to the productive sector. Peralta, Dias, and Gonçalves (2018) emphasize that the legal and curricular configuration of technical and vocational training has sought primarily to meet economic demands, consolidating a highly flexible model. Official reports reinforce this understanding, pointing to vocational education as an essential driver of the U.S. economy (United States of America, 2012a). In addition, OECD data (apud DIEESE, 2019) show that U.S. teachers' salaries are among the highest in the world, exceeding the organization's average. The recognition of the career contributes to the quality of teaching and to the strong articulation between school and market. Thus, the U.S. model privileges immediate employability and adaptability, although it reproduces inequalities in access to formations of greater academic and social prestige.

At this point, the international literature frequently points to the German dual system as a reference in school–enterprise articulation (Euler, 2013). The model is more structured and institutionalized, prioritizing employability and integration with the productive sector. Although Euler (2013) does not specifically address the comparison with the United States, this analytical approximation makes it possible to understand that linkage to the market may be a strength but carries the risk of reinforcing inequalities if there are no inclusion policies and equitable regulation.

In Costa Rica, Technical and Vocational Education and Training (TVET) is organized into three main programs: the Professional Technical Colleges of the Ministry of Public Education (*Colegios Técnicos Profesionales del Ministerio de Educación Pública – CTP-MEP*), the National Learning Institute (*Instituto Nacional de Aprendizaje – INA*), and the Para-University Institutions. While the first two offer formal pathways for progression to higher education or labor market insertion, the INA, historically classified as non-formal, began in 2019 a process of formalization through the National Qualifications Framework (Camacho Calvo, 2023). A distinctive feature of the Costa Rican model is the participation of the productive sector in curricular design, albeit with divergent perceptions. A report by the Office of the Comptroller General (2022) shows that 75.1% of employers consider the offer to be poorly aligned with demands, while the majority of teachers and graduates evaluate it positively. Mandatory internships strengthen employability, with a 63.3% insertion rate of graduates (INEC, 2019). However, as Camacho Calvo (2023) observes, the country faces the challenge of balancing international pressures — especially from the OECD — with local needs, particularly in advancing the dual modality.

Comparing these experiences, it can be observed that the global pressure to align TVET with the market may compromise the emancipatory function of education, especially in countries marked by inequalities.

The results of this comparison suggest three central mechanisms that structure the observed differences: (i) regulatory alignment, associated with the clarity and strength of legal frameworks and qualifications; (ii) the density of school–work connections, expressed in internships, dual apprenticeship, and sectoral councils; and (iii) institutional teacher capacity, determined by salary recognition, continuing education, and working conditions.

To synthesize the main convergences and divergences identified, Chart 1 is presented below, which organizes in a comparative way the legal frameworks, curricular models, school–work connections, teacher recognition, and main challenges in the three countries analyzed.

Chart 1 – Policies and challenges of vocational education in comparative perspective.

ASPECTS ANALYZED	BRAZIL	UNITED STATES	COSTA RICA
Main legal frameworks	LDB (1996); Law No. 11,892/2008; Decree No. 5,154/2004	Carl D. Perkins Act (2006; 2012); state legislation	Educación Diversificada; Instituto Nacional de Aprendizaje (INA); National Qualifications Framework (2019)
Curricular model	Integrated Secondary Education (general–technical integration); integrated and concurrent modalities	Flexible High School; academic and technical pathways; diverse certifications	Diversified education (academic, technical, artistic); multiple certification alternatives

School–work connections	Poorly systematized internships; local productive arrangements at the IFs	Strong presence of the productive sector; on-the-job learning	Mandatory internships; insertion rate of 63.3% of graduates (INEC, 2019)
Teacher recognition	National minimum wage (2008), with non-compliance in some states; 13% salary gap (DIEESE, 2019)	Teacher salaries among the highest in the OECD; recognition of the career	No explicit data in the study; budgetary constraints mentioned in general terms
Impacts and challenges	Normative advances, but difficulties in implementation and regional inequality	Flexibility and immediate employability; social and racial inequalities persist	Social and community inclusion; tensions between international pressures and local needs

Source: Compiled by the authors based on Brazil (1996; 2008), DIEESE (2019), OECD (2020), Peralta, Dias, and Gonçalves (2018), Camacho Calvo (2023), UNESCO (2019), INEC (2019).

Overall, the three cases allow for the identification of convergences and divergences. They converge in recognizing that vocational education is strategic in the face of the transformations of the post-Fordist era and of globalization. They diverge, however, in their emphases: Brazil bets on curricular integration, but faces obstacles in implementation and teacher recognition; the United States consolidates a flexible model strongly oriented toward the market, sustained by the recognition of the teaching career; and Costa Rica adopts a community-based and inclusive perspective, articulating education and the productive sector, but tensioned by global influences.

For the Brazilian case, the comparisons suggest three priority fronts: (a) standardizing curricular integration through technical support to state and municipal networks; (b) expanding and qualifying school–work connections, with territorial councils and supervised internships of a national character; and (c) strengthening teacher recognition, not only in salary terms, but also through continuing education programs focused on curricular integration and the pedagogical use of technologies.

Thus, the set of analyses (Souza & Santos, 2021; OECD, 2020; DIEESE, 2019; Peralta; Dias; Gonçalves, 2018; Camacho Calvo, 2023) shows that there is no single model of success, but different paths that reflect historical, cultural, and socioeconomic realities. For Brazil, the comparison suggests the need to strengthen the integration of theory and practice, to enhance the recognition of the teaching career, and to expand the connection with the productive sector, without abandoning contextualized policies that ensure social inclusion and citizen emancipation.

Conclusion

The present study comparatively analyzed vocational education in Brazil, the United States, and Costa Rica, demonstrating how each country responds in a distinct way to recent transformations in the labor market. In a scenario marked by the

reconfiguration of labor relations under the regime of flexible accumulation (Harvey, 1996), discourses of entrepreneurship and individual responsibility intensify, while at the same time forms of labor insertion mediated by digital platforms and characterized by flexible ties and greater precariousness gain ground — elements associated with the so-called gig economy. These dynamics have direct repercussions on social expectations regarding training for work and impose new challenges on vocational education, especially in relation to curricular updating, the articulation between school and productive sector, and the promotion of formative trajectories that combine technical training with critical development.

It was found that, although the three countries recognize the strategic importance of vocational education, the paths followed differ according to their historical, cultural, and socioeconomic contexts. Brazil has advanced at the normative level by instituting the integration of secondary education and technical training but still faces structural difficulties in implementation and teacher recognition, elements that compromise the effectiveness of educational policies. The United States has consolidated a pragmatic, market-oriented, and highly flexible model, sustained by the recognition of the teaching career and by the strong linkage between school and productive sector. Costa Rica, in turn, has adopted a perspective of inclusion and diversity, articulating TVET programs with business participation, but faces the challenge of balancing international pressures with local needs, especially in advancing the dual modality.

The analyses also revealed common challenges: the need for constant updating of curricula in the face of the technological transformations of the post-Fordist era; the tension between immediate preparation for the labor market and the critical and integral formation of students; and the search for equity policies that ensure access and permanence in contexts of social inequality.

From the standpoint of public policies, three implications emerge transversally: (i) teacher recognition as a central factor in sustaining quality; (ii) the strengthening of connections between school and productive sector, ensuring regulatory mechanisms that prevent inequalities; and (iii) the institutionalization of integrated curricula, capable of combining technical, scientific, and civic competencies.

For Brazil, the comparison suggests the importance of strengthening the theory-practice integration, enhancing the recognition of the teaching career, and broadening the articulation with the productive sector, drawing inspiration from both U.S. flexibility and the Costa Rican inclusive dimension. More than importing models, the task is to build contextualized policies that consider local and regional demands, ensuring social justice and the formation of critical and autonomous subjects.

It is recommended that subsequent research deepen the analysis on three fronts: (a) longitudinal monitoring of graduates' insertion in the labor market; (b) intra-regional comparative studies in Latin America, including countries such as Chile, Mexico, and Colombia; and (c) impact evaluation of curricular integration programs in Brazil. These investigations may broaden the understanding of the mechanisms that explain the effectiveness of vocational education and provide evidence for the continuous improvement of policies.

Thus, it is concluded that there is no single model of success in vocational education. There are, rather, different possibilities, whose experiences may serve as a reference for the improvement of the national scenario, contributing to the development of a vocational education that reconciles quality, inclusion, and social relevance.

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