

Brazilian Federal Institutes – Potentials and Challenges for Public VET's Reputation

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Abstract

Vocational Education and Training (VET) faces significant global challenges, particularly due to its varying reputation and the preference for academic professions, which are associated with higher social status and salaries. This issue is especially pronounced in Brazil, where VET participation is low and dropout rates are high [29]. The division between public and private VET institutions has resulted in a mixed reputation nationwide. Federal Institutes (FIs), which offer public and tuition-free education, face challenges in terms of acceptance and reputation, while private, fee-based VET institutions enjoy high enrollment rates. This research aims to identify not only the challenges faced by the FIs but also the opportunities they have as unique stakeholders in Brazil's educational landscape. The focus of the study is on the role FIs can play in enhancing the reputation of public VET, with an analysis of educational governance, institutional frameworks, and their relevance to the skills ecosystem approach.

1. Introduction

Globally, VET faces multifaceted challenges rooted in its diverse reputation and the evolving landscape of labor market demands. This situation is exacerbated by the higher social recognition and salaries associated with academic professions, posing a dilemma amid escalating needs for skilled workers, particularly at the intermediate qualification level [6; 23]. The significance of VET in addressing global skill shortages underscores its critical role, yet its perception varies widely across countries, notably in Brazil, where issues such as low participation rates and high dropout rates persist [29].

In particular, the different offerings in the VET system, which are based on financial resources and the resulting reputation, exacerbate educational inequalities. The Federal Institutes (FIs) have been trying to address this problem since the early 2000s. However, they are confronted with the challenge of being subject to very heterogeneous perceptions and thus not being able to use their full potential. The potential to establish a regional skill ecosystem, as well as the role of teachers in educational institutions

and the resulting influence on the social perception of FIs, are the focus of this paper. The results derive from 23 interviews with educational representatives at the FIs. The interview material was analyzed in order to highlight the role of the responsible organizational and educational actors in these institutions. The symbiosis of individual design and requirements in terms of the skill ecosystem approach provides an analytical framework, showing how the skill ecosystem approach contextualizes systemic influences, including institutional and political frameworks. Despite the complex role of the FIs and the polyvalent roles both governmental structures and internal organization play, the findings hint towards a dissonant relationship regarding the contribution of the FIs in shaping VET. In order to generate a holistic picture, this article therefore aims to answer the following question: What role do FIs play at a governmental level in shaping VET education in Brazil, and how can their internal structures be outlined as contributing factors? The results provide insights into the general perception of the public VET system in terms of structural challenges, but also reveal the critical self-reflection of individual directors and lecturers, who describe the FIs as partly misperceived institutions with untapped potential.

2. Status Quo: Brazilian VET System and Students' Aspirations

Brazil's VET system, including public and private institutions, is shaped by various institutional and political framework conditions. The public FIs provide free, high-quality education tailored to regional economic, cultural, and social needs. They offer a range of programs from initial qualifications to advanced degrees, embodying the concept of 'verticalization.' This section outlines both the VET system and the career aspirations of young people in Brazil.

2.1. Brazilian VET System

The Brazilian educational system offers VET through public and private institutions. Upper

secondary VET integrates general and vocational subjects, allowing access to tertiary education, while apprenticeships target 14–24-year-olds at the secondary level, combining practical and theoretical training [28]. Both pathways prepare students for specific occupations. Since the 1940s, Brazil's VET system has evolved within two main streams, which will be presented in the following.

Federal Institutes

FIs, which are public, tuition-free, and fully government-funded educational institutions, shape the Public Federal System. They offer programs that align with the economic, cultural, and social needs of their regions. This system provides education for all students in the country, focusing on local differences and aims to address especially vulnerable groups. Especially the FIs are a crucial component of the public VET system. Courses range from short initial qualifications to integrated secondary technical programs, and even master's and PhD programs, a concept known as 'verticalization'.

The creation of the federal professional education network, led by the FIs, follows international trends in expanding higher and professional education and increasing policy transfer. This network aims to bridge post-secondary education and the labor market, fostering social mobility [6; 13; 15].

The FIs are widely distributed across Brazil, including rural areas, with 85% of the 654 campuses located inland [25]. However, between 2019 and 2022, budget cuts and austerity measures significantly affected the FIs, resulting in reduced funding for their operations, infrastructure, and research. As Brazil currently undergoes political changes, this situation may improve within the next decade.

S-System

The so-called S-System comprises nine institutions funded by specific levies, offering paid programs and additional services like leisure and cultural activities [1]. It is a network of private VET institutions funded by specific levies, requiring students to pay for their programs. This system provides VET programs that combine vocational training with general education, targeting youth aged 14 to 24 through apprenticeships [28], whilst focusing on promoting qualifications and meeting workforce demands specific to local economies, making it essential for skills development [36]. Unlike the FIs, which offer public, tuition-free education, the S-System serves as an alternative when the FIs cannot accommodate all students. The FIs are aligned with regional economic development and are generally perceived to have a lower ranking in national comparisons of VET quality [22].

In 2018, around 41% of enrollments were in the

for-profit S-System due to limited capacity in the public federal system [7]. The parallel growth of professional education alongside the university sector is linked to the middle class's increasing demand for higher education as a means of social and economic mobility [39]. Still, as the FIs do offer identical educational possibilities by enabling educational mobility, it is surprising to see them with lower participation rates than the chargeable S-System, hinting towards individuals' career choices and perception of the FIs.

2.2. Perceptions of VET in Brazil

The relationship between education and inequality in Brazil is complex and represents a significant challenge for the nation. Brazil, characterized by its diverse socio-economic landscape, grapples with substantial disparities in educational opportunities and outcomes, reflecting broader societal inequalities [4; 26]. Education and inequality in Brazil are closely linked, presenting significant challenges due to the country's diverse socio-economic landscape [4; 26]. VET participation is low compared to other OECD countries, with a high upper secondary VET dropout rate of 11% [29]. Despite a 6.4 percentage point increase in upper secondary professional education enrollment over the last decade, growth remains slow relative to educational demands [16].

Structural, cultural, economic, and policy-related

The structural, cultural, economic, and policy-related factors contribute to this challenging situation. Some of the most relevant aspects in this context are a lack of awareness, stigmatization, educational system biases, inadequate career counseling, insufficient resources, limited employer engagement, and regional disparities [3; 10; 14]. Furthermore, socio-cultural influences, such as parents, friends, and teachers, significantly affect career aspirations.

Public schools, tasked with educating about 50 million students, often face lower reputations compared to private schools, with responsibilities divided among municipalities, states, and the federal government [40]. Social and regional inequalities, such as access to the internet, libraries, and computers, further complicate educational quality assessments [16]. Additionally, the demand for public university spots often exceeds availability [22].

Considering these aspects, the FIs can theoretically offer a benefit by providing additional services, information and, in particular, local labor market requirements. Nevertheless, the FIs have a more negative connotation compared to the S-System [29]. Although one reason for this can be explained by local differences [28], this is not an absolute indicator of the comparatively widespread critical view of the FIs.

2.3. Impact of Organizational and Educational Individual Actors

Teachers in Brazilian FIs are pivotal in shaping both the perception of VET in general and the societal view of these educational institutions. They play a significant role in implementing educational policies and customizing teaching methodologies to address the diverse needs of students, thereby enhancing the reputation of VET programs [12]. The caliber of teaching directly influences institutional reputation by affecting student outcomes and overall satisfaction. For instance, the FIs make substantial contributions to the training of chemistry educators, providing a considerable share of the available training slots, which highlights their integral relevance in educational development [37]. Moreover, teachers actively support students with special educational needs through initiatives such as the so-called Individualized Educational Plan (IEP). However, challenges persist in fully addressing these needs [35]. To fulfill their job effectively, teachers must possess several key competencies or characteristics:

- *Adaptability*: The ability to modify teaching methods in response to the varied needs of students and to integrate new technologies is essential for fostering effective learning and ensuring relevance in an ever-evolving educational landscape [35].
- *Professional Development*: Ongoing learning and professional growth are crucial for educators to keep abreast of the latest educational practices and innovations. This commitment not only enhances student outcomes but also bolsters the institution's reputation [37].
- *Inclusivity*: A deep commitment to inclusive education is vital, particularly the capacity to support students with special needs, in order to create an equitable learning environment [34].
- *Collaboration*: Engaging in effective collaboration with colleagues and community stakeholders enriches educational practices and strengthens the institute's connections with local entities [12].
- *Innovative Teaching*: The use of innovative and project-based learning strategies fosters critical thinking and problem-solving skills among students, enhancing the institute's reputation for quality education [32].

Collectively, these attributes are instrumental in the success of students and in shaping a positive perception of Brazilian FIs. This framework provides

a comprehensive understanding of the essential role that teachers play within these institutions.

3. Theoretical Approach: Multidimensional Impact Factors

This section outlines the skill ecosystem approach at a macro level, which is a key factor influencing regional labor markets and thus VET education. This approach is derived from the multidimensional legitimation of educational participation according to Boeren et al. (2010), that social issues both influence the individual in their educational decision and the prevailing institutions. These, in turn, are supported and shaped by the employees, which is why the following section also reflects the theoretical aspects explaining their role within educational institutions and governmental structures in shaping educational measures. This section establishes a theoretical framework in order to outline key factors influencing the individual and, as a result, social perceptions of (public) VET.

3.1. Skill Ecosystem Approach and its Holistic Perspective

The holistic model of the skill ecosystem approach, influenced by Finegold [18] and Brown [8], focuses on the high-skill-ecosystem concept. This approach views educational choices and professional development as influenced by the surrounding ecosystem, leading to diverse educational and economic pathways. It connects labor market demands with policy-driven supply, offering solutions to skill-related challenges in both global and local contexts.

Within the approach, an ecosystem is catalyzed by specific triggers, such as influential companies, and is characterized by continuous support, a nourishing environment, and a high degree of interdependence among actors [18]. It evolves from the need for highly skilled individuals to adapt to changing environments and to support the continuous growth of professionals [8; 18]. The approach also highlights variations in skill usage in the labor market, depending on skill levels and individual application [11].

Focusing on long-term training solutions, the skill ecosystem approach adopts a holistic perspective. It encompasses not just immediate training but also strategies like job restructuring and comprehensive solutions to address skill shortages [21]. This geographically bound approach identifies five central elements [9; 30]:

- Entrepreneurial conditions and business models.
- Institutional and political framework conditions.

- Access to the labor market.
- Structure of employment relationships.
- Structures of production and skill levels.

However, this focus on the need for skilled workers and special qualification profiles can also have a negative impact on the labor market. Occupational areas may be displaced or less strongly supported, as stronger industry players are preferred from a political perspective. As a result, there is an asymmetry of information and training opportunities, particularly for vulnerable groups.

Furthermore, the skill ecosystem approach, though originating from the global North, is not completely applicable to the global South due to challenges arising from, e.g., cultural differences [8]. Nevertheless, it provides a framework for understanding regional differences in educational choices and qualifications.

3.2. Institutional Frameworks and Governance in Education

Institutions can be classified into two categories: institutions “with actors,” commonly referred to as organizations, and institutions “without actors,” which encompass normative systems [20; 31]. There exists a relationship between institutions and organizations, as institutions are influenced either through organizations, which comprise individual actors, or directly by individuals themselves. Organizations extend beyond mere contractual arrangements among individuals, functioning as a unit or collective actor [2]. North further categorizes organizations into several types: “The term organization includes public bodies (political parties, the senate, a city council, an administrative authority), legal entities of economic life (companies, trade unions, family-owned farms, cooperatives), and educational institutions (schools, universities, vocational training centers)” [27]. North summarizes the interplay between institutions, organizations, and individuals by stating, “It is the interaction between institutions and organizations that shapes the institutional evolution of an economy. If institutions are the rules of the game, organizations and their entrepreneurs are the players” [27].

The Governance Approach

The governance approach builds on the tradition of institutional analysis but places greater emphasis on individual actors and their possible configurations. This involves an endeavor to analyze an institution, a sector of action, or a social system not solely in terms of legal and normative categories, but also in relation to the resources available to individual actors. The

governance perspective is increasingly applied to studies of the education sector [24]. Initially, the focus is placed on the actors and their constellations. New institutional economics starts from the principle of methodological individualism. This principle posits that the characteristics of a social system ultimately depend on the actions and incentive structures of the individuals, whose behaviors and decisions constitute the social system and its order [33].

Methodological individualism also pertains to organizations in institutional economics, as they are formed by individuals who act within them. Therefore, organizations and their acting individuals must be considered in the analysis.

Educational governance deals with the actors and actor constellations within the education sector [24]. In terms of analyzing action coordination, contributions from individual actors must be identified. On an analytical level, a distinction is made between individuals, referred to as individual actors, and organizations, known as collective actors, with the latter ultimately forming a coalition of individual actors (*ibidem*). The actions of collective actors are determined by the actions of individuals. Individual actors primarily include educators and learners, such as instructors, students, and pupils. Within the category of organized actors in the governance framework, a distinction is made between “collective actors” and “corporate actors.” Collective actors are characterized by their actions depending on the interests of their members (e.g., trade unions), while corporate actors operate independently of their members’ interests (e.g., universities, educational administrations) [24]. They further emphasize that empirically observable units must be distinguished from analytical units. Analyzing individual and collective actors yields insights into their intentions and goals, their action and steering strategies, and their capacities and resources. Overall, the unit of analysis in the governance perspective is the interactive collaboration of these actors, highlighting the actor constellation (*ibidem*).

Quality Dimensions in Educational Processes

Euler differentiates between input, process, output, and outcome in the context of quality discussions in education and the assessment of learning processes [17]. He defines “input” as the resources that become effective in the learning process. Processes determine how effectively the inputs are transformed into outcomes, while output measures the performance results, and outcome describes the effects of these processes. Euler also identifies various quality dimensions for the categories he distinguishes [17]. For input, these may include the competence of personnel, the scope of material resources, or legal frameworks such as curricula. Possible dimensions for processes are the

design of the teaching/learning process, the learning and organizational culture, leadership of the educational institution, collaboration with the environment, administration, and further training of instructors. Outputs or products can be specified as the academic and non-academic achievements of learners and the success of transfer. On the other hand, the outcome, or the impact of the educational process, can be measured through alumni employment success and the satisfaction of employers.

A central approach to delineating terminology related to the input-output discussion is the educational product function proposed by Timmermann and Windschild [38]. They similarly distinguish between categories of input, execution, output, transfer, and outcome, as well as subjective satisfaction. Timmermann and Windschild describes the outcome as the effect of the output directed towards work actions, while the output only refers to the qualifications and competencies immediately achieved after the educational measure [38]. Additionally, Gonon points out that it is essential to differentiate between micro, meso, and macro levels [19]. He outlines the quality assurance of education primarily as a management task for enterprises and educational institutions. Quality assurance, in this understanding, can be perceived as the management of uncertainties, which serves the legitimacy of organizations [9; 19]. Consequently, quality assurance is a crucial instrument for legitimizing educational institutions with respect to society and individuals choosing to engage in learning processes at these institutions.

4. Methodological Approach

Given that the FIs offer the complete spectrum of educational degrees available in the Brazilian system, their representatives are uniquely positioned to provide comprehensive insights. To capture the general perception of the Brazilian public VET system as viewed by stakeholders within the FIs, we developed a qualitative exploratory research design. We conducted 23 semi-structured interviews with a diverse group of educational representatives, including 4 rectors and 19 faculty members, from various regions of Brazil. The sample included 10 male and 13 female participants, ensuring balanced gender representation.

The regional distribution of interviewees was as follows:

South (n=4)

Southeast (n=7)

Centre-West (n=5)

Northeast (n=4)

North (n=3)

The Southeast region had a higher number of participants due to its demographic significance and the number of FIs located there. We employed structured qualitative content analysis to collect valuable insights into the factors influencing the attractiveness and perception of the FIs within the Brazilian VET system.

5. Results

This section presents the central findings structured using the following categories: institutional frameworks, actor constellations within the VET system, and the influence of the skill ecosystem. The data analysis allows the presentation of a comprehensive picture of the challenges and opportunities influencing the VET system in Brazil from the perspective of the organizational and educational actors at the FIs. It illustrates how institutional frameworks, actor constellations, and the skill ecosystem are interconnected, shedding light on the nuances of VET perception in Brazil.

Institutional Framework and Structural Challenges

The interviews reveal that the existing institutional and political frameworks for VET in Brazil are characterized by various structural challenges. The interviewees noted an increasing political influence on the VET sector and the FIs. They described insufficient political engagement in promoting the FIs, resulting in an imbalance in perception compared to traditional universities as well as the private S-System. One representative stated, "We are still very concerned about this issue of community perception" (VETinBrazil_Lu13), outlining both the political perception and the resulting public reputation as hindrances the FIs face. Additionally, interviewees expressed concerns that political disapproval and public avoidance tend to be structural problems the FIs struggle to overcome, as there is a lack of information distribution about the FIs as public VET facilities. In comparison to these challenges, the FIs are characterized as public institutions meeting local demand by offering specialization in region-specific occupations. Therefore, they are seen as crucial contributors to the infrastructure of the region, especially due to their internal structure as local public educational facilities that support students with educationally disadvantaged backgrounds.

Educational Inequalities

Another significant theme emerging from the interviews concerns educational inequalities, particularly regarding the effects of financial resources on the accessibility of VET offerings. Here, the interviewees specifically articulated the need to adapt VET programs to meet the needs of

disadvantaged groups, highlighting that "the institutes aim to bring quality education to the interior, giving access to many people who would never be able to go to a big city" (VETinBrazil_Ro12). Participants also pointed out that differences in perception and willingness to participate in VET programs persist across regions. This is also reflected in the commitment the FIs receive, as students with less family support tend to drop out of the FIs due to financial or personal reasons. This is linked to the first category of structural problems, as inequalities tend to be a structural issue both at the local and national levels. The FIs try to address the needs of these disadvantaged groups by offering financial support as well as a flexible teaching schedule, such as moving lessons to afternoon classes. However, interviewees expressed frustration about the limited actions they can take.

Actor Constellations in the VET System

Individual Actors - The influence of teachers and learners within the FIs is crucial for the perception and functionality of VET. Influential actors within the FIs include rectors and teachers. The interviewed teachers particularly outlined their motivation to contribute to VET education and support students' career aspirations. They emphasized that the qualifications and commitment of faculty members directly influence the quality of educational offerings and acceptance. One interviewee remarked, "Not only do we have many professors who are already qualified with a doctorate, as would be expected for a university" (VETinBrasil_Pa04), but they also noted the high commitment of these teachers, as they prefer VET education despite the lower salary to support young students. This support is mentioned on an individual level, including emotional support (e.g., teachers as contact persons) and personal relationships.

Collective Actors - The interactions among various educational institutions and other stakeholders, such as businesses and government agencies, play a central role in shaping the VET system. The results indicate that unions and other organizations have a significant influence on the perception and structure of VET by acting as mediators between different interests and fostering participatory approaches. As one interviewee noted, "Everywhere you arrive, you will see a federal institution" (VETinBrazil_Fa11), hinting at the strong presence and availability of the FIs. In this context, the interviewees also referred to the relevance of structural factors, as the FIs, as local partners, are linked to regional social structures, which necessitates collaboration with other stakeholders, such as general schools or regional governments. If this collaboration is successful, the interviewees perceive the social perception as having a positive connotation. However,

if it is not successful, it potentially leads to avoidance and frustration among teachers, as they remain limited in their scope of action.

Skill Ecosystem as Influencing Factor

Contextual Factors in the Regions - The skill ecosystem approach highlights the connection between institutional frameworks and the perception of VET. The interviewees underscored how social and cultural factors influence the educational and career choices of young people. The perception of the FIs as places that provide vocational qualifications and social mobility is shaped by these contextual factors. One interviewee expressed that "Professional education is an instrument of opportunity for people who want to develop in this area" (VETinBrazil_Ja05), referring to the local orientation of the FIs toward the labor market. However, the interviewees are also critical of the professionalization this generates, as the focus on specific areas of activity means that no comprehensive general education is offered, and students who do not yet have a professional orientation or are aiming for a different discipline, for example, are not addressed. One interviewee pointed out that these students then only use the FIs as a stepping-stone to transfer to other educational institutions or find another job.

Employability and Qualification Levels - The findings illustrate the impacts of labor market demand on the design of VET programs. In particular, the adaptation of VET content to regional and global requirements is crucial for enhancing graduates' employability. Interviewees emphasized the necessity for VET programs to be flexible enough to address current trends and skills shortages, stating, "Our intuition has this characteristic of verticalization and of allowing people to study in their region" (VETinBrazil_Je09). It was also noted that close collaboration with industry could improve the quality of training and employment opportunities for students.

6. Conclusion

Challenges and opportunities of the Brazilian VET System - The results of the conducted interviews highlight critical insights into the Brazilian public VET system, elucidating the multifaceted perceptions and challenges faced by the FIs. The participants of this study illustrated a general acknowledgment of the structural hurdles entrenched in the VET landscape, particularly the insufficient political and community engagement in promoting these institutions. This aligns with findings from existing literature, which suggest that the social perception of VET often hinges on the visibility and recognition it receives from various stakeholders, particularly in comparison to

traditional academic pathways [6; 29]. The interviews reveal that educators within the FIs are acutely aware of their crucial role in shaping both educational delivery and occupational aspirations among students. They express a dual commitment to innovation and inclusivity, mirroring sentiments found in the literature that highlight the necessity for educators to sustain continuous professional development and to engage collaboratively with community stakeholders [12; 35]. The notion of adaptability, emphasized by the interviewees, resonates strongly with the skill ecosystem approach, positing that educators must respond dynamically to evolving regional and global demands to enhance student employability [8; 18].

However, despite the insightful reflections of educators on the transformative potential of the FIs, the interviews also reveal the persistent stigmatization of VET in Brazil, echoing the findings of previous studies that point to the hesitance of youth to enroll in VET programs due to negative societal perceptions [29; 4]. The recurring theme of educational inequalities, predominantly due to financial disparities, brings to light an urgent need for policy interventions that foster equitable access to quality education.

Methodologically, while the qualitative exploratory design allowed for in-depth insights into stakeholder perceptions, certain limitations must be acknowledged. The relatively small sample size of 23 interviews could affect the generalizability of the findings, particularly when considering the vast cultural and socio-economic diversity across Brazil. Additionally, the regional bias indicated by a higher number of interviewees from the Southeast could distort the understanding of VET perceptions in other areas, particularly when assessing the distinct challenges faced in rural versus urban contexts. In light of these limitations, future research should aim to incorporate larger, more diverse samples and to explore quantitative measures to complement the qualitative findings. A broader comparative analysis across different regions and educational systems could yield valuable insights into the effectiveness of varied VET models and the socio-cultural factors at play.

Furthermore, one of the most significant practical implications emerging from this study is the need for enhanced collaboration between the FIs and local industry stakeholders. Such partnerships could provide students with more practical opportunities and contextual understanding, fostering a more favorable perception of VET in the community and addressing the mismatches between labor market demands and educational outputs. Additionally, leveraging technology and innovative pedagogy in the curriculum may further increase engagement among students, thereby combating the stigma associated with VET.

In conclusion, the interviews underscore a nuanced understanding of the Brazilian VET system, shaped by complex socio-political dynamics and the pivotal role of educators. While challenges related to perception, accessibility, and educational equity persist, the insights gained through these discussions highlight pathways toward integrated solutions for an effective and recognized VET framework in Brazil, thereby contributing to the ongoing discourse on VET's significance in addressing global skill shortages.

7. References

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