

# Territory, Technological Education and Labour Market Integration of Graduates from Higher Education Technology Programmes in the State of São Paulo (Brazil)

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## ABSTRACT

This article analyses the labour market integration of graduates from Higher Education Technology Programmes offered by the São Paulo State Colleges of Technology (Fatecs), focusing on the interaction between technological education, employment conditions and territorial characteristics. The study addresses contemporary transformations in the world of work, including automation, artificial intelligence, platformisation and the persistence of informality, low productivity and structural heterogeneity in Brazil. Methodologically, it adopts an applied, predominantly quantitative, exploratory-descriptive and comparative approach. Primary data from graduate questionnaires concerning employment status, formalisation, income and occupational alignment were examined alongside socioeconomic and productive indicators relating to the territories in which the Fatecs are located. The results reveal substantial differences among graduates from the same educational network. Formal employment rates in the cases highlighted range from approximately 42.5% to 81.3%, while the proportion of graduates working in occupations related to their field of study ranges from approximately 42.1% to 61.9%. Income and technological intensity also vary across territories and do not necessarily move in the same direction as formalisation or occupational alignment. These findings indicate that technological education expands individual capabilities and professional opportunities, but does not by itself guarantee high-quality labour market integration. The conversion of qualifications into formal employment, adequate income, occupational alignment and technologically intensive work depends on the economic, productive and institutional conditions of regional labour markets. The study therefore argues for a multidimensional understanding of labour market integration and highlights the importance of coordinating technological education with innovation, productive development and regional development policies more broadly.

**Keywords:** technological education; labour market integration; regional development; future of work.

## INTRODUCTION

Contemporary transformations in the world of work involve automation, artificial intelligence, platformisation, informality, and the fragmentation of professional trajectories. In this context, the debate is no longer focused solely on the availability of jobs, but increasingly considers the quality of employment, its stability, alignment with educational background, income-generating capacity, social protection, and opportunities for professional development. Work, therefore, is not disappearing; rather, it is undergoing transformation, requiring a broader analysis of the different forms of labour market integration.

In Brazil, this debate is particularly important given the high levels of informality, low productivity, inequality, and regional heterogeneity. The impacts of new technologies are not homogeneous, as they are shaped by economic, social, institutional, and territorial factors. Consequently, the labour market integration of graduates from technological education depends not only on individual qualifications but also on the productive structure and the opportunities available within each territory.

The aim of this article is to analyse the labour market integration of graduates from the São Paulo State Colleges of Technology (Faculdades de Tecnologia do Estado de São Paulo – Fatecs), considering technological education, income, occupational alignment with their field of study, the technological intensity of occupations, and regional socioeconomic characteristics. The study seeks to understand how technological education contributes to labour market integration and how different territorial contexts shape its outcomes.

This research is justified by the need to move beyond approaches to labour market integration that focus exclusively on obtaining employment. A broader understanding of labour market integration makes it possible to incorporate dimensions such as job quality, income, professional trajectories, social protection, and territorial opportunities.

Methodologically, the study adopts an exploratory and analytical approach, drawing on data from graduates of different Fatecs concerning employment, income, alignment between occupation and educational background, and the technological intensity of occupations. These data are examined in conjunction with socioeconomic and productive indicators relating to the respective territories.

The study is based on the hypothesis that technological education is relevant but insufficient, on its own, to ensure high-quality labour market integration. Its effectiveness depends on the interaction between individual capabilities and territorial ecosystems of opportunity, thereby contributing to the debate on technological education, regional development, and the future of work.

## LITERATURE REVIEW

### **The future of work amid automation, stagnation and precarisation**

The contemporary debate on the future of work has been shaped by the spread of automation, artificial intelligence, robotics, and the algorithmic mediation of labour activities. In parts of the academic literature and public debate, these transformations are associated with the possibility of the growing replacement of human labour by machines. This interpretation, however, tends to simplify a more complex process. Technology eliminates certain tasks, but it also creates new functions, reorganises existing occupations, and alters the division of labour between people and machines. The central issue, therefore, is not merely whether jobs will continue to exist, but what kinds of jobs will be created, under what conditions, and to what extent they will be capable of ensuring income, stability, social protection, and professional development.

Martin Ford (2015) provides one of the best-known formulations of the view that the current wave of technological change differs from previous technological revolutions. According to Ford, contemporary automation extends beyond manual and repetitive work, reaching cognitive, administrative, and technical tasks that were previously relatively protected by educational attainment. Artificial intelligence systems can perform activities involving classification, prediction, customer service, data analysis, and information processing, thereby expanding the potential for task substitution even within more highly skilled occupations. Studies such as that of Frey and Osborne (2017), which estimated the susceptibility of hundreds of occupations to computerisation, further reinforced concerns regarding the potential effects of automation on broad segments of the labour market.

This interpretation, however, must be considered alongside the literature emphasising the complementary relationship between technology and labour. In this respect, Autor (2015) argues that automation replaces certain tasks but also raises productivity, generates new forms of demand, and increases the value of human activities that complement machines. Similarly, Acemoglu and Restrepo (2019) distinguish between the “displacement effect”, associated with the substitution of human tasks by capital, and the “reinstatement effect”, arising from the creation of new tasks in which labour retains comparative advantages. The ultimate impact of innovation on employment therefore depends on the balance between these forces, rather than on a technologically predetermined trajectory towards the elimination of labour.

More recent research on generative artificial intelligence, such as that of Gmyrek et al. (2023), likewise suggests that technological exposure does not necessarily imply the elimination of occupations. In many activities, AI is

more likely to automate portions of occupational content and alter the organisation of tasks than to replace jobs altogether.

In this sense, the effects may be particularly significant in relation to job quality, affecting autonomy, work intensity, occupational content, and qualification requirements. The central issue thus shifts from the mere quantity of jobs to the concrete ways in which technology transforms occupations.

This perspective is especially relevant when considering platformisation, as digital platforms have increasingly come to organise the supply of and demand for labour, control access to tasks, determine remuneration, assess performance, and distribute risks through algorithmic systems. De Stefano (2016) showed that on-demand work and crowdwork can increase flexibility and opportunities, while also generating insecurity, fragmentation of employment relationships, and reduced labour protection. The International Labour Organization (ILO, 2021) reinforces this perspective by demonstrating that digital platforms transform not only specific sectors, but also the mechanisms through which work is organised and supervised. Technology, therefore, should not be analysed solely as an instrument for increasing productivity, but also as a mechanism of management and control.

In the Brazilian context, this debate must take into account structural characteristics that predate the current expansion of artificial intelligence. High levels of informality, productive heterogeneity, inequality, and the significant presence of low-productivity occupations shape the effects of new technologies. Antunes (2020) draws attention to the expansion of outsourced, intermittent, digitalised, and precarious forms of work, particularly in the service sector.

Precarisation, therefore, cannot be attributed exclusively to automation. It is linked to broader processes of productive restructuring, the weakening of employment relationships, the transfer of risks to workers, and the expansion of flexible forms of employment. It is precisely at this point that Benanav's (2020) contribution becomes particularly important. The author challenges interpretations that attribute primary responsibility for the contemporary crisis of work to automation. In his view, the decline in demand for good-quality employment is also related to slower economic growth, deindustrialisation, weak productivity dynamics, and the expansion of low-paid service-sector employment. Automation may intensify existing trends, but it does not, by itself, explain stagnation and precariousness. This interpretation is particularly useful for peripheral economies, in which technologically advanced sectors coexist with low-productivity segments and limited social protection.

The territorial dimension must also be incorporated into the analysis. In this regard, Ross (2016) argues that the benefits associated with robotics, big data, artificial intelligence, and other emerging technologies tend to be concentrated in ecosystems endowed with universities, infrastructure, innovative firms, research networks, and institutional capacity. The effects of technological transformation therefore vary according to the productive structure and the opportunities available in each region, and workers with similar educational backgrounds may experience different outcomes in terms of income, occupational alignment, and job quality depending on the territory in which they are located.

This perspective is central to the analysis of the labour market integration of graduates from technological education, because qualifications remain important, but their conversion into higher-quality employment depends on the economic, productive, and institutional conditions of the territory. A degree enhances individual capabilities, but does not in itself guarantee alignment between education and occupation, adequate remuneration, or integration into technologically intensive activities. It is therefore necessary to articulate educational, industrial, technological, and regional development policies.

The future of work should thus be understood as the outcome of the interaction between technological change, economic structure, institutional regulation, and social relations. Automation may eliminate tasks and deepen inequalities, but it may also raise productivity, create new functions, and reduce repetitive activities. Its effects depend on the choices made by firms, governments, and social institutions. For vocational and technological education, the challenge lies not only in preparing individuals to adapt to new technologies, but also in contributing to ecosystems capable of transforming qualifications into good-quality employment by integrating innovation, social protection, and territorial development.

## **The Brazilian labour market: informality, low productivity and inequality**

An analysis of the future of work in Brazil requires recognition that recent technological transformations are taking place within a historically heterogeneous labour structure, characterised by high levels of informality, social inequality, low productivity, and marked regional disparities. For this reason, the debate on automation, artificial intelligence, and digitalisation cannot simply be transposed from advanced economies to the Brazilian context. In Brazil, these changes interact with long-standing structural problems associated with the unequal formation of the labour market, weaknesses in social protection, and limitations in productive development.

The Brazilian labour market developed in a highly segmented manner. The late transition from enslaved labour to free labour, the regional concentration of industrialisation, and rapid urbanisation contributed to the coexistence of modern sectors alongside low-productivity activities. Oliveira (2003) interprets this dynamic as the outcome of a modernisation process that combines advancement and backwardness, while Furtado (2007) highlights the persistence of economic structures capable of reproducing inequality and regional disparities. This perspective is closely aligned with the Latin American structuralist tradition, according to which underdevelopment should not be understood merely as a stage preceding development, but rather as a specific economic configuration.

The concept of structural heterogeneity is particularly important in this debate. As Prebisch (2000) and Pinto (1970) argue, Latin American economies display substantial productivity differences across sectors and activities, combining technologically advanced segments with others characterised by low productivity and limited income-generating capacity.

In the Brazilian case, Squeff and Nogueira (2013) demonstrate that these disparities persisted throughout the development process, also manifesting themselves in differences in income, educational attainment, and formalisation. Labour market integration therefore depends not only on individual qualifications but also on the productive structure of the territory in which the worker is located.

Informality is one of the most persistent expressions of this heterogeneity. It involves not only the absence of formal registration, but also income instability, limited social protection, contractual fragility, and restricted capacity for collective organisation. Antunes (2020) relates this phenomenon to a broader process of precarisation and flexibilisation of labour relations. The recent expansion of platform-mediated work has reinforced this tendency. Abílio (2020) shows that so-called uberisation reorganises practices already present in the Brazilian labour market, such as self-employment, the transfer of risks to workers, and variable remuneration, now combined with algorithmic management and permanent availability.

Precarisation, therefore, did not emerge with digital platforms or artificial intelligence, since a significant share of the Brazilian labour force was already subject to unstable employment relationships, low pay, and limited protection before the current phase of digitalisation.

What is new, therefore, is the combination of traditional forms of informality with technological mechanisms of management, control, and evaluation. Workers may undertake multiple activities, combine different sources of income, and depend on platforms to access opportunities, while at the same time remaining responsible for the costs and risks associated with their work. This situation makes the distinction between employment, self-employment, and informality increasingly complex.

Another central issue is low productivity. This cannot be explained solely by workers' qualifications, since productivity also depends on the productive structure, capital investment, infrastructure, firms' innovation capacity, and organisational arrangements. De Negri and Cavalcante (2014) emphasise that Brazil's weak productivity dynamics are related to systemic factors and the limited diffusion of technology across firms and sectors. Squeff and De Negri (2013) further argue that the rigidity of the productive structure contributes to the persistence of substantial productivity differences between activities. Policies focused exclusively on vocational training are therefore likely to produce limited results when they are not accompanied by investment, innovation, and productive transformation.

This issue is particularly relevant to technological education, since expanded educational attainment and vocational training improve individuals' conditions for labour market integration, but do not in themselves guarantee employment that corresponds to the qualifications acquired. A graduate may possess relevant technical skills but encounter a regional labour market unable to absorb them.

Consequently, when the local productive structure is characterised by low technological density, limited business diversification, or weak demand for specialised occupations, a degree may not translate into higher income or stronger alignment between education and employment.

Social inequalities also influence this conversion process. Bourdieu (1998) shows that educational and professional trajectories are shaped by the unequal distribution of economic, cultural, and social capital. Sen (2000), in turn, provides a framework for understanding qualifications as capabilities that are transformed into effective freedoms only when concrete opportunities exist for them to be exercised. From this perspective, education and individual competences must be linked to skilled employment, intermediation networks, infrastructure, mobility, and public policies capable of expanding real opportunities.

The territorial dimension makes this issue even more evident, since skilled employment opportunities are unevenly distributed across regions and municipalities. Territories characterised by greater industrial density, the presence of universities, innovative firms, and diversified productive chains tend to provide better conditions for labour market integration, whereas regions that are more dependent on low-productivity activities may restrict the correspondence between education and occupation. Technological modernisation may therefore intensify polarisation between workers employed in knowledge-intensive sectors and those concentrated in low-productivity services or informal activities. This situation is consistent with Pochmann's (2012) observation that Brazilian economic growth did not eliminate the concentration of a substantial share of the labour force in occupations located at the lower end of the income structure.

This finding reinforces the need to move beyond an interpretation of employability centred exclusively on individual attributes. In analysing the labour market integration of Fatec graduates, it is more appropriate to consider the relationship between qualifications, job quality, income, alignment between education and occupation, social protection, and territorial conditions. Technological education constitutes an important mechanism for expanding professional capabilities, but its outcomes depend on the concrete opportunities provided by local labour markets.

The Brazilian labour market should therefore be understood through the interaction between informality, low productivity, social inequality, productive heterogeneity, and territorial disparities. In this context, the challenge is not merely to prepare workers for technological change, but to create economic and institutional conditions capable of converting qualifications into good-quality employment. For graduates of technological education, this means recognising that a degree is an important, yet insufficient, condition: its conversion into income, occupational alignment, and sustainable professional trajectories depends on the articulation between education, productive structure, innovation, regional development, and social protection.

## METHODOLOGY

This is an applied study adopting a predominantly quantitative approach, with an exploratory-descriptive and comparative design. Its aim is to analyse the labour market integration of graduates from the São Paulo State Colleges of Technology (Faculdades de Tecnologia do Estado de São Paulo – Fatecs), considering the relationship between technological education, working conditions, and the socioeconomic characteristics of the territories in which they are located.

The study includes graduates from different Fatec campuses situated in distinct regional contexts, thereby enabling comparisons between different economic and productive environments and an examination of the extent to which territorial characteristics are associated with the observed labour market outcomes.

Primary data were collected through a questionnaire administered to graduates, covering information on employment status, formal employment arrangements, income, and the correspondence between educational

background and occupation. These data were combined with socioeconomic and productive indicators obtained from institutional sources.

The analysis was organised around the following dimensions: labour market integration and formalisation, income, and occupational alignment. The results were initially examined using descriptive and comparative analysis and subsequently related to the economic, productive, and technological characteristics of the respective territories.

The study is based on the hypothesis that technological education is an important factor in labour market integration, although its outcomes are also shaped by the opportunities and structural characteristics of the territories in which graduates are located.

## **RESULTS AND DISCUSSION**

The results reveal important differences in the labour market integration of graduates from the Fatecs included in the study. Although the institutions belong to the same technological education network, variations can be observed in terms of employment formalisation, income, alignment between education and occupation, and the technological intensity of the activities performed. These contrasts indicate that technological education constitutes an important element in professional trajectories, but its effects are not distributed uniformly and are also associated with the economic and productive characteristics of the respective territories.

### **Integration into the formal labour market**

Integration into the formal labour market varies substantially across the territories analysed. Among the cases highlighted in the study, rates range from approximately 42.5% to 81.3%, revealing considerable variation among graduates from the same educational network.

This result suggests that qualifications alone do not determine access to formal employment. Opportunities also depend on the regional capacity to generate and absorb skilled labour, the sectoral composition of the economy, and the dynamism of local businesses.

This finding is consistent with Benanav's (2020) interpretation that job creation depends on economic dynamism and on the capacity of economies to generate demand for labour, rather than solely on technological development. It also converges with De Negri and Cavalcante (2014), who relate productivity, innovation, and labour market performance to the systemic characteristics of the productive structure.

Thus, similar forms of technological education may produce different outcomes when graduates enter labour markets with differing capacities to generate formal employment.

### **Income and the economic returns to education**

The data also reveal significant differences in graduates' income levels. Although per capita income should be interpreted with caution, particularly because it is influenced by household composition, its variation across territories provides additional evidence of the heterogeneity of labour market integration conditions.

The economic return to technological education is therefore not uniform. Territories with more dynamic and diversified productive structures are better able to generate skilled occupations that may provide greater opportunities for the recognition and remuneration of acquired competences, whereas regions with less diversified labour markets may constrain such returns.

This interpretation can be related to Sen's (2000) approach, according to which education expands individual capabilities, but such capabilities are transformed into effective opportunities only when economic and institutional conditions exist for their exercise. A qualification therefore broadens workers' potential opportunities, but its conversion into income also depends on the existence of concrete employment opportunities.

## **Alignment between Education and occupation**

The correspondence between education and professional activity constitutes another important dimension of the results. Among the cases contrasted in the study, the proportion of graduates working in occupations related to their field of study ranges from approximately 42.1% to 61.9%.

These findings show that obtaining employment does not necessarily imply the professional use of the specific competences acquired during the course of study. A significant proportion of graduates are employed in activities that are partially or entirely unrelated to their educational background.

This result reinforces the importance of the characteristics of the regional productive structure. As Ross (2016) argues, the benefits associated with qualifications and new technologies tend to be greater in ecosystems that bring together firms, infrastructure, productive networks, and institutions capable of absorbing specialised competences. In territories where these conditions are weaker, qualified workers may be compelled to undertake activities that are less closely aligned with their educational background.

Occupational alignment therefore constitutes an important measure of the quality of labour market integration, as it distinguishes the mere attainment of employment from the effective professional utilisation of technological education.

## **Territory, heterogeneity and the quality of labour market integration**

The combined analysis of the indicators shows that there is no single pattern of labour market integration. One territory may perform relatively well in terms of formalisation but less favourably in terms of technological intensity; another may display stronger occupational alignment without necessarily generating higher income. The indicators therefore reveal different configurations of labour market integration.

This diversity can be interpreted through the concept of structural heterogeneity developed by Prebisch (2000) and Pinto (1970), and subsequently applied to the Brazilian context by Squeff and Nogueira (2013). The coexistence of sectors with different levels of productivity, technological content, and income-generating capacity gives rise to equally differentiated labour markets.

The study suggests that this heterogeneity is also manifested territorially. The opportunities available to graduates vary according to the local economic structure, regional technological intensity, the presence of firms and productive chains, and the degree of correspondence between the education provided and existing labour demand. These factors emerge within the study itself as elements associated with the differences observed across territories.

It is important to emphasise, however, that the results reveal associations and contrasts and do not, in isolation, allow causal relationships to be established between specific territorial characteristics and graduates' labour market outcomes. Variables such as the course completed, previous professional experience, individual socioeconomic conditions, and territorial mobility may also influence the results.

## **From employability to labour market integration**

The results reinforce the need to move beyond an interpretation of professional outcomes based exclusively on employability. The employment rate indicates whether a graduate has entered the labour market, but it does not provide a comprehensive assessment of the quality of that integration.

The combined analysis of formalisation, income, and occupational alignment moves towards a broader perspective on the quality of graduates' labour market integration, taking into account the conditions under which work is performed, its correspondence with educational background, its technological content, and its capacity to support a sustainable professional trajectory.

This distinction is particularly important because the indicators do not necessarily move in the same direction. A graduate may be formally employed while performing work only weakly related to their education; another

may work in an activity with high technological content but under less protected employment arrangements. No single indicator is therefore sufficient to represent the quality of labour market integration.

## Summary of Results

The overall findings make it possible to summarise the main results, as presented in Table 1.

Table 1. Summary of the results concerning graduates' labour market integration

| Dimension                                   | Observed result                                                                                                           | Interpretation                                                                                                             |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Labour market integration and formalisation | Substantial differences across territories, with rates ranging from approximately 42.5% to 81.3% in the cases highlighted | Similar educational backgrounds do not produce homogeneous outcomes across different labour markets                        |
| Income                                      | Significant variation across the territories analysed                                                                     | The economic return to education is also shaped by the regional productive structure                                       |
| Occupational alignment                      | In the cases compared, approximately 42.1% to 61.9% work in activities related to their field of study                    | A degree does not automatically ensure correspondence between education and occupation                                     |
| Relationship between indicators             | Formalisation, income, occupational alignment, and technological intensity do not necessarily display the same pattern    | Labour market integration is multidimensional in nature                                                                    |
| Territorial dimension                       | Different outcomes among graduates belonging to the same educational network                                              | Economic structure, technological profile, and productive networks shape professional opportunities                        |
| Overall result                              | Technological education is relevant, but insufficient on its own to explain the quality of labour market integration      | Labour market integration results from the interaction between education, individual trajectories, and territorial context |

**Source:** Authors' own elaboration based on the survey of Fatec graduates.

The table shows that the main contribution of the study does not lie in establishing a ranking among campuses, but rather in demonstrating the multidimensional nature of labour market integration. The results vary according to the indicator considered, revealing that employment, income, occupational alignment, and technological intensity represent distinct yet complementary dimensions.

In this respect, the findings support the central hypothesis of the article: technological education is important, but insufficient to ensure high-quality labour market integration. A degree enhances individual capabilities, but its conversion into formal employment, income, occupational alignment, and more technologically intensive activities also depends on the opportunities available within the territory.

The main conclusion can therefore be expressed in more analytical terms: the quality of labour market integration results from the interaction between technological education and territorial ecosystems of opportunity. This finding shifts the discussion away from a narrow focus on employability towards a broader perspective on labour market integration and reinforces the need to coordinate policies concerning technological education, regional development, innovation, and productive structure.

## CONCLUSION

Contemporary transformations in the world of work show that the main challenge can no longer be framed solely in terms of job creation or job destruction. Automation, artificial intelligence, platformisation, and productive

restructuring are changing the content of occupations, forms of employment, and professional trajectories. In an economy such as Brazil's, characterised by informality, low productivity, inequality, and structural heterogeneity, the decisive question becomes a different one: what kind of labour market integration is being offered to workers, and under what conditions can it be sustained over time?

The results of this study indicate that technological education remains important in expanding graduates' professional opportunities, but is not sufficient, on its own, to guarantee good-quality employment. The differences observed in formalisation, income, and alignment between education and occupation demonstrate that graduates belonging to the same educational network may experience significantly different professional trajectories. A degree expands individual capabilities, but the extent to which these capabilities are converted into concrete opportunities depends on the economic, productive, and technological characteristics of the territory.

This finding shifts the discussion from employability towards the quality of graduates' labour market integration. Knowing whether a graduate has obtained employment is important, but insufficient. It is also necessary to examine whether they work in their field of study, the conditions under which they are employed, the income they receive, the technological content of their work, and the opportunities for professional development associated with their occupation. The existence of employment does not necessarily imply high-quality labour market integration. Likewise, higher levels of education do not automatically lead to economic mobility when the territory lacks activities capable of absorbing and valuing the competences acquired.

The results therefore reinforce the importance of the territorial dimension, since the heterogeneity observed across the indicators suggests that regional labour markets have differing capacities to convert technological education into professional opportunities. Productive structure, technological intensity, business density, economic diversification, and linkages between educational institutions and the productive sector are important elements in this process. This does not imply attributing an exclusive causal role to territory, but rather recognising that it forms part of the set of conditions shaping graduates' professional trajectories.

This finding has important implications for vocational and technological education policy itself. If education does not operate in isolation, the assessment of an educational institution should not be restricted to the number of graduates or even to their employment rate. It is also necessary to consider the quality of their labour market integration and the economic conditions of the environment in which that integration takes place. Similarly, education policies cannot be designed separately from policies on innovation, productive development, and regional development. Training highly qualified professionals in territories that are unable to absorb them amounts to transferring to individuals responsibility for a problem that is also structural.

In this respect, the study allows two recurring interpretations of the future of work to be reconsidered. The first is the idea that technology, by itself, will determine professional outcomes; the second is the expectation that expanding educational attainment will be sufficient to resolve problems of labour market integration. Neither machines inevitably determine the future of work, nor does a degree, by itself, guarantee a satisfactory professional trajectory. Between technology and the worker lies an economic, institutional, and territorial structure that distributes opportunities in profoundly unequal ways.

For the Fatecs, this conclusion does not diminish the importance of their mission; on the contrary, it broadens its scope. Technological education can play a strategic role in regional development precisely when it succeeds in establishing closer links between knowledge, innovation, productive structure, and territorial needs.

The challenge, therefore, is not simply to train workers for existing jobs, but to contribute to the development of ecosystems capable of generating more productive, technologically intensive, and socially sustainable forms of employment.

The future of work, therefore, should not be understood as an inevitable consequence of technological advancement, but rather as the outcome of the ways in which society, the state, firms, and educational institutions choose to organise and distribute the benefits of innovation. The real challenge is not merely to ensure that graduates find work, but to create the conditions under which education can be converted into good-quality

employment. A degree opens up possibilities, but it is the combination of education, productive structure, and territory that determines how far those possibilities can extend.

## REFERENCES

1. Abílio, L. C. (2020). Uberização: A era do trabalhador just-in-time? *Estudos Avançados*, 34(98), 111–126. <https://doi.org/10.1590/s0103-4014.2020.3498.008>
2. Acemoglu, D., & Restrepo, P. (2019). Automation and new tasks: How technology displaces and reinstates labor. *Journal of Economic Perspectives*, 33(2), 3–30. <https://doi.org/10.1257/jep.33.2.3>
3. Antunes, R. (2020). *O privilégio da servidão: O novo proletariado de serviços na era digital* (2nd ed.). Boitempo.
4. Autor, D. H. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of Economic Perspectives*, 29(3), 3–30. <https://doi.org/10.1257/jep.29.3.3>
5. Benanav, A. (2020). *Automation and the future of work*. Verso.
6. Bourdieu, P. (1998). A escola conservadora: As desigualdades frente à escola e à cultura. In M. A. Nogueira & A. Catani (Eds.), *Escritos de educação* (pp. 39–64). Vozes.
7. De Negri, F., & Cavalcante, L. R. (2014). Os dilemas e os desafios da produtividade no Brasil. In F. De Negri & L. R. Cavalcante (Eds.), *Produtividade no Brasil: Desempenho e determinantes* (Vol. 1, pp. 15–52). ABDI; Ipea.
8. De Stefano, V. (2016). The rise of the “just-in-time workforce”: On-demand work, crowdwork and labour protection in the “gig-economy” (Conditions of Work and Employment Series No. 71). International Labour Office.
9. Ford, M. (2015). *Rise of the robots: Technology and the threat of a jobless future*. Basic Books.
10. Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting and Social Change*, 114, 254–280. <https://doi.org/10.1016/j.techfore.2016.08.019>
11. Furtado, C. (2007). *Formação econômica do Brasil* (34th ed.). Companhia das Letras.
12. Gmyrek, P., Berg, J., & Bescond, D. (2023). Generative AI and jobs: A global analysis of potential effects on job quantity and quality (ILO Working Paper No. 96). International Labour Organization. <https://doi.org/10.54394/FHEM8239>
13. International Labour Organization. (2021). *World employment and social outlook 2021: The role of digital labour platforms in transforming the world of work*. International Labour Organization.
14. Oliveira, F. de. (2003). *Crítica à razão dualista/O ornitorrinco*. Boitempo.
15. Pinto, A. (1970). Naturaleza e implicaciones de la “heterogeneidad estructural” de la América Latina. *El Trimestre Económico*, 37(145), 83–100.
16. Pochmann, M. (2012). *Nova classe média? O trabalho na base da pirâmide social brasileira*. Boitempo.
17. Prebisch, R. (2000). O desenvolvimento econômico da América Latina e alguns de seus problemas principais. In R. Bielschowsky (Ed.), *Cinquenta anos de pensamento na CEPAL* (Vol. 1, pp. 69–136). Record; CEPAL.
18. Ross, A. (2016). *The industries of the future*. Simon & Schuster.
19. Sen, A. (2000). *Desenvolvimento como liberdade*. Companhia das Letras.
20. Squeff, G. C., & De Negri, F. (2013). Produtividade do trabalho e rigidez estrutural no Brasil nos anos 2000. *Radar: Tecnologia, Produção e Comércio Exterior*, (28), 27–38.
21. Squeff, G. C., & Nogueira, M. O. (2013). *A heterogeneidade estrutural no Brasil de 1950 a 2009* (Textos para Discussão CEPAL-Ipea No. 51). CEPAL; Ipea.