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Technological Acceleration and the Precarisation of Work

Reflections on Social Justice, the Right to Life, and Environmental Education

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20.1 INTRODUCTION

This chapter aims to provide the reader with a comprehensive overview of contemporary discussions surrounding labour and human rights in the context of technological acceleration using the context of Brazil. In times of profound digital transformation, labour relations have been shaped by growing platformisation, precarisation, and inequality, demanding a critical analysis of the new forms of exploitation and the social and political responses to these challenges.

The chapter is structured around a bibliographical review of authors who address the intersection of labour, technology, and human rights, including Rafael Grohmann, Ricardo Antunes, Ludmila Costhek Abílio, Trebor Scholz, Paul Singer, and Renato Dagnino. These scholars provide a solid foundation for understanding how platformisation processes and algorithmic management have redefined labour dynamics, exacerbating social and economic inequalities. In particular, it discusses how the gig economy and the 'uberisation' of work have transformed labour relations, increasing worker vulnerability while reducing their protections and rights.

Throughout the chapter, we investigate how the regulation of digital work and the recognition of labour rights, especially on digital platforms, have become topics of debate in Brazil, particularly in a scenario of increasing automation and social exclusion. We analyse initiatives such as Fairwork, which has emerged from the fight to promote decent working conditions in the context of digital platforms. Additionally, we highlight the difficulties faced by workers involved in this digital economy, such as the lack of security, income instability, and the opaque control exercised by companies through algorithmic management.

Finally, we bring environmental education to these discussions, showing how it can significantly contribute to addressing the socio-economic and environmental inequalities associated with platform capitalism. Environmental education, especially from the perspective of environmental justice, offers a critical lens that not only addresses ecological issues but also reflects on the social and political

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conditions that affect the most vulnerable workers. The connection between education, human rights, and technology thus becomes an important avenue for building more just socio-environmental relations.

20.2 CONTEXTUALISING THE DISCUSSION: DIGITAL TRANSFORMATIONS AND LABOUR INEQUALITIES IN BRAZIL

In recent years, the rapid advancement of digital technologies has profoundly transformed labour markets worldwide. As Brazil navigates this wave of digitalisation, a critical issue arises: that of the inequalities faced by vulnerable workers in this evolving landscape. Although digitalisation offers remarkable opportunities for efficiency and innovation, it also introduces new forms of disparity and exclusion. Vulnerable workers – often those in low-paying jobs, informal sectors, or with limited access to technology – are particularly susceptible to the adverse effects of this transformation, which directly impacts their well-being and economic stability.

Globally, and especially in Brazil, the intensification of labour exploitation has been used as a measure to revitalise and stabilise capitalist accumulation.[1] According to Neves, processes of precarisation, outsourcing, and informal labour are essential for the expansion of capitalism. The shift in the labour organisation model, which makes it increasingly flexible, is strongly marked by the platformisation of work.[2] The accelerated advancement of digital technologies and the growing automation of production processes have generated profound transformations in the world of work, while simultaneously accentuating socio-economic inequalities.

In this context, workers face the risk of alienation and exclusion as technological development advances at an ever-increasing pace without adequate social protection mechanisms and adaptation to the new labour realities. According to the Economic Commission for Latin America and the Caribbean, technological progress has been accompanied by a series of socially negative outcomes, such as the exclusion of a significant portion of the population from the benefits of digitalisation, mainly owing to insufficient incomes that limit access to quality connectivity, suitable devices, and reliable domestic connections. Additional problems include the proliferation of fake news, the increase in cyberattacks, growing privacy risks, and the issue of electronic waste.[3]

The COVID-19 pandemic exacerbated these issues, bringing negative impacts on jobs, wages, and efforts to combat poverty and inequality, especially in countries such as Brazil, where structural constraints, such as connectivity problems and

[1] D. Neves, 'A exploração do trabalho no Brasil contemporâneo' (2022) 25 *Revista Katálysis* 1, 11–21.

[2] R. Grohmann, 'Plataformização do trabalho: entre dataficação, financeirização e racionalidade neoliberal' (2020) 22 *Revista EPTIC* 1, 106–22.

[3] Comisión Económica para América Latina y el Caribe (CEPAL), *Tecnologías Digitales para un Nuevo Futuro* (LC/TS.2021/43) (Santiago: CEPAL, 2021).

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social inequalities, further limit the benefits of digital technologies.[4] While common elements can be identified in the digitalisation process across different countries, it is crucial to recognise the particularities of each location and region. The social dynamics and inequalities that characterise each context are accentuated by digitalisation, which often does not allow collective struggles to take shape or rights to be strengthened.

Rafael Grohmann, in his book *Os Laboratório do Trabalho Digital* (*The Digital Labor Laboratories*), argues that contextualising the geopolitics of platform labour also means understanding the different meanings of work in the economies of each country, distinguishing experiences between the global North and South.[5] Grohmann and Abílio et al. highlight that while the term 'gig economy' emerged in the global North to describe the platform work landscape, in Brazil, this nomenclature does not apply in the same way, as the Brazilian economy has always been characterised by a management of survival for the working class, now intensified by the transition to the digital under a liberal rationality.[6] Thus, platform-mediated subordinate labour is embedded in contemporary dilemmas related to mapping and recognising worker exploitation and its centrality in current forms of capitalist accumulation.[7]

Ricardo Antunes, one of Brazil's most prominent labour sociologists, notes that before 2020, more than 40 per cent of the Brazilian working class was in informal situations, a situation that worsened further with the COVID-19 pandemic.[8] According to him, 'we are living in a new level of real subordination of labour to capital under algorithmic governance, with the working class living between the disastrous and the unpredictable'.[9] In our view, this scenario reinforces Grohmann's analysis of the gig economy where workers, placed in precarious and unstable conditions, struggle to secure only the bare minimum for their survival.[10] These workers, constantly pressured by low wages and volatile conditions, cannot surpass the subsistence barrier, leaving them with only the effort to cover basic expenses, without the possibility of reaching an income that provides any kind of stability or economic progress.

Despite the over-exploitation of labour being a constant in Brazil and Latin America, it is evident that technological advances are transforming the ways in which the working class faces precarisation and exploitation.[11] In this context,

[4] Ibid.

[5] R. Grohmann (ed.), *Os Laboratórios do Trabalho Digital: Entrevistas* (São Paulo: Boitempo Editorial, 2021).

[6] Ibid.; L. C. Abílio, H. Amorim, and R. Grohmann, 'Uberização e plataformização do trabalho no Brasil: conceitos, processos e formas' (2021) 23 *Sociologias* 57, 26–56.

[7] Abílio et al., 'Uberização e plataformização do trabalho no Brasil'.

[8] R. Antunes, 'Capitalismo de plataforma e desantropomorfização do trabalho', in R. Grohmann (ed.), *Os Laboratórios do Trabalho Digital: Entrevistas* (São Paulo: Boitempo Editorial, 2021), pp. 33–8.

[9] Ibid., p. 33.

[10] Grohmann, *Os Laboratórios do Trabalho Digital*.

[11] Antunes, 'Capitalismo de plataforma e desantropomorfização do trabalho'.

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Fairwork emerges as a relevant initiative both in Brazil and globally.[12] This project, based at the Oxford Internet Institute and the WZB Berlin Social Science Centre, works closely with workers, platforms, lawyers, and legislators in various parts of the world to think about and develop a fairer future for work. The Brazilian team is co-ordinated by professors Rafael Grohmann, Julice Salvagni, Roseli Figaro, and Rodrigo Carelli. Additionally, we highlight the efforts of researchers, such as Ludmila Costhek Abílio, Abílio et al., Grohmann, Rebechi et al., and many others who are fighting for the recognition and defence of the labour rights of workers within the context of digital platforms.[13]

In 2023, the second Fairwork Brazil report was published, continuing to examine how the major digital labour platforms in the country align with Fairwork's decent work principles amid intense disputes and debates about platform labour regulation.[14] The document highlights that after the election of Luiz Inácio Lula da Silva for his third term as president of Brazil, a working group was established to discuss the regulation of platform labour in the country, involving the participation of companies, workers, and government representatives. Another important fact concerns how digital platforms use lobbying practices to influence legislation and public policies, often using subtle tactics and data manipulation to distort and contest notions of decent work.

In this regard, the phenomenon of uberisation exemplifies the adverse conditions faced by digital platform workers in Brazil, as described by Abílio and Santiago in the 'Dossiê das violações dos Direitos Humanos no Trabalho Uberizado' ('Dossier on Human Rights Violations in Uberised Work').[15] Uberisation, as the dossier defines it, refers to the growing precarisation of labour relations promoted by digital platforms such as Uber and iFood. In Brazil, workers face structural problems, including the lack of basic labour rights, unsafe working conditions, and the absence of the formal recognition of their activities as regular employment. Platform-mediated work has given rise to various terms worldwide and in Brazil that attempt to describe the specific forms of precarisation associated with this reality.

[12] See Centro de Pesquisa em Comunicação e Trabalho (CPCT), 'Relatório Fairwork Brasil 2023' (2023), https://comunicacaoetrabalho.eca.usp.br/publicacoes_cpct/relatorio-fairwork-brasil-2023/.

[13] L. C. Abílio, 'Uberização e juventude periférica. Desigualdades, autogerenciamento e novas formas de controle do trabalho' (2020) 39 *Novos Estudos. CEBRAP* 3, 579–97; L. C. Abílio, 'Uberização: a era do trabalhador just-in-time?' (2020) 34 *Revista Estudos Avançados – IEA – USP* 98, 111–26; L. C. Abílio, 'Uberização: manicures, motoboys e a gestão da sobrevivência', in L. Marques (ed.), *Trajetórias da Informalidade no Brasil Contemporâneo* (São Paulo: Fundação Perseu Abramo, 2021), pp. 173–91; Abílio et al., 'Uberização e plataformização do trabalho no Brasil'; Grohmann, 'Plataformização do trabalho', Grohmann, Os Laboratórios do Trabalho Digital; and C. N. Rebechi et al., 'Trabalho decente no contexto das plataformas digitais: uma pesquisa-ação do Projeto Fairwork no Brasil' (2023) 74 *Revista do Serviço Público* 2, 370–89.

[14] CPCT, 'Relatório Fairwork Brasil 2023'.

[15] L. C. Abilio and S. M. Santiago, *Dossiê das violações dos direitos humanos no trabalho uberizado: o caso dos motofretistas na cidade de Campinas* (Campinas, SP: UNICAMP/Diretoria Executiva de Direitos Humanos, 2024).

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Besides the terms 'gig economy' previously mentioned, and 'uberisation', we highlight new vocabularies that have been incorporated into research on the world of work. Among them is the concept of the 'just-in-time worker',[16] 'crowdwork', and 'work on demand'.[17] These terms reflect the different dimensions of the gig economy, which encompasses both crowdwork (work performed through online platforms) and on-demand work managed by apps ('work on demand via apps').

Based on De Stefano's contributions, we understand that crowdwork involves the performance of tasks through online platforms that connect clients and workers globally, ranging from simple microtasks to more complex jobs.[18] On-demand work via apps includes traditional activities such as transportation and cleaning, managed by apps that set quality standards. While crowdwork has global characteristics and on-demand work responds to local aspects, both share characteristics such as payment and management methods. We know these terms are more complex than presented here, but the goal is not to exhaust the concepts, but rather to highlight the reflections of these practices in the world of work. Additionally, differences between platforms can impact legal issues, such as the validity of contracts and applicable legislation.

Therefore, the problems faced by platform workers include income instability, where earnings vary significantly and often do not cover living costs. Additionally, these workers do not have access to benefits such as health insurance, pensions, or protection against work-related accidents, and they bear the full cost of work tools, such as vehicles and smartphones, exacerbating their financial vulnerability.[19] Another critical aspect is algorithmic management, which subjects workers to opaque control, meaning there is no transparency in this relationship.[20] Abílio et al. add that algorithmic management is based on automated instructions that process large volumes of data, influencing both the workers' daily actions and consumer dynamics.[21] This work organisation model generates instability and a lack of clarity in the rules.

20.3 FORMS OF RESISTING THE DEEPENING OF PLATFORM CAPITALISM INEQUALITIES

The book *Platform Cooperativism: Challenging the Corporate Sharing Economy* by Trebor Scholz, translated and commented on in Portuguese by Rafael Zanatta, emphasises that platform capitalism deepens labour precarisation, offering unstable

[16] Abílio, 'Uberização'.
[17] V. De Stefano, 'The rise of the "just-in-time workforce": on-demand work, crowdwork and labour protection in the "gig-economy"' (2016) 37 *Comparative Labor Law Journal* 3, 471–504.
[18] De Stefano, 'The rise of the "just-in-time workforce"'.
[19] Abílio and Santiago, Dossiê das Violações dos Direitos Humanos No Trabalho Uberizado.
[20] T. A. C. Moreira, 'Gestão algorítmica', in A. S. P. Oliveira and P. Jerónimo (eds.), *Liber Amicorum Benedita Mac Crorie. Volume II* (Braga: UMinho Editora, 2022), pp. 551–68.
[21] Abílio et al., 'Uberização e plataformização do trabalho no Brasil'.

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and rights-deprived conditions while concentrating wealth and power in the hands of a few, thereby intensifying economic inequality.[22] The lack of regulation allows these companies to operate without social responsibility, exploiting workers under the false promise of autonomy and flexibility. Furthermore, this model contributes to the erosion of traditional labour rights, such as paid vacation and health insurance, aggravating de-regulation and worker vulnerability – a point already addressed by other authors throughout this publication. However, Scholz's main contribution, in our view, lies in his proposal for platform cooperativism, which offers a fairer and more democratic alternative to this exploitation.[23]

Scholz's proposal opposes the logic of the sharing economy, advocating for the creation of worker-controlled labour platforms, offering a more equitable and democratic alternative to the exploitation inherent in current corporate models.[24] In this same book, Rafael Zanatta discusses the origins of cooperativism in Brazil, which is linked to the early days of the Republic and the immigration process aimed at replacing slave labour and adapting to urbanisation and changes in productive structures. However, the dimension of cooperativism in Brazil followed a business logic, only giving way to more solidarity-based proposals during the Lula administration (2002–10) with the creation of the National Secretariat for Solidarity Economy within the Ministry of Labour and Employment.

In this context, it is essential to highlight the importance of the solidarity economy and social technologies, which have been gaining strength in Brazil since the 1980s and 1990s. These initiatives, whose names are associated with Paul Singer and Renato Dagnino, aim to promote solidarity-based and democratic forms of labour organisation, serving as resistance to capitalist exploitation methods. As previously mentioned, Brazil faces a legacy of social inequality and the exploitation of the working class since its origins. Therefore, we believe that platform cooperativism shares the same goals as social technology and the solidarity economy.

Social technology emerges as a tool that promotes collaboration, inclusion, and social transformation, designed to meet the specific needs of communities. By characterising technology as 'social', we recognise that it is not neutral and that its applications can have varying impacts.[25] This understanding challenges the traditional view of technology, which often prioritises profit over social and environmental well-being. It is within this context that the movement for social technology arises, which, according to Dagnino, constitutes a rejection of conventional technology, seeking alternatives that prioritise the collective and sustainability.[26]

[22] T. Scholz, *Cooperativismo de Plataforma* (São Paulo: Elefante, 2016).
[23] Ibid.
[24] Ibid.
[25] R. Dagnino, *Tecnologia Social: Contribuições Conceituais e Metodológicas* (Campina Grande, PB: EDUEPB, 2014).
[26] R. Dagnino, *Tecnociência Solidária: Um Manual Estratégico* (Marília, SP: Lutas Anticapital, 2019).

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Paul Singer, in turn, argues that the solidarity economy presents itself as an alternative to the neoliberal model, seeking fairer forms of production and trade.[27] Singer discusses the solidarity economy as a response to the context of inequality, highlighting its capacity to generate income and empower communities.[28] Singer argues that 'there is no way to ignore that the solidarity economy is an integral part of the capitalist social formation, in which capital concentration incorporates technical progress and thus determines the conditions of competitiveness in each market'.[29]

Singer adds that the formation of cooperatives or cooperative complexes reveals an organisational strategy aimed at strengthening cooperativism in the face of capitalist dynamics.[30] In a scenario where capital is concentrated in the hands of a few, technological advances tend to favour this concentration, resulting in growing inequalities. Therefore, while the solidarity economy tries to mitigate the negative effects of capital concentration, it is also influenced by these conditions, revealing the interdependence between the two systems.

In this context, platform cooperativism emerges as an alternative that enhances this logic of collaboration and coordination among cooperatives. Social technology aligns with this perspective of platform cooperativism by proposing technological alternatives to facilitate collaboration between cooperatives and their members, promoting an organisational model that values community participation and autonomy. These platforms not only offer tools for management and commercialisation but also foster the exchange of knowledge and experiences, essential for strengthening cooperativism and the solidarity economy. Alvear et al. argue that:

> Among the numerous difficulties faced by cooperatives and solidarity economy enterprises, one of them is access to technology, particularly technologies that are suited to their organizational structures and values. Authors such as Dagnino (2004; 2019) and Varanda and Bocayuva (2009) emphasize how conventional technologies reinforce capitalist values and organizational forms, and thus, Social Technology would be the appropriate technology for solidarity enterprises.[31]

Social technology and the solidarity economy, when integrated into platform cooperativism, can help build more robust networks where cooperatives from different sectors can come together and develop solutions adapted to their local realities. This is especially relevant in contexts of vulnerability, where communities need support to overcome economic and social challenges. All these theoretical and methodological efforts share a common denominator – building foundations to achieve decent work.

[27] P. Singer, 'Economia solidária: geração de renda e alternativa ao liberalismo' (1997) 26 *Proposta* 72, 7–13.
[28] Ibid.
[29] P. Singer, 'Economia solidária versus economia capitalista' (2001) 16 *Sociedade e estado* 1-2, 100–12, at 109.
[30] Ibid.
[31] C. A. Alvear, R. Neder, and D. Santini, 'Economia solidário 2.0: por um cooperativismo de plataforma solidário' (2023) 9 *P2P e Inovação* 2, 42–61, at 50.

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20.4 HUMAN RIGHTS AND WORKER PROTECTION IN THE ERA OF TECHNOLOGICAL ACCELERATION

The concept of fair and decent work has its roots in the labour struggles of the twentieth century, formally defined in 1999 by the International Labour Organization (ILO). Even in the twenty-first century, this remains a central demand within the United Nations (UN) 2030 Agenda, as part of the Sustainable Development Goals (SDGs).[32] The UN recognises that decent work is essential for eradicating poverty and promoting prosperity. This concept encompasses working conditions that ensure fundamental rights, social protection, and equal opportunities. SDG 8 emphasises the importance of decent work and sustainable economic growth, acknowledging that promoting proper working conditions is essential not only for eradicating poverty but also for fostering prosperity and social well-being.

Achieving this goal involves ensuring labour rights, combating unemployment, promoting job security, and encouraging social dialogue. In an increasingly globalised and constantly changing world, the challenge of ensuring fair and dignified working conditions becomes even more relevant, requiring collective efforts from governments, businesses, and civil society. Amid these changes, human rights emerge as a crucial anchor for safeguarding the dignity and working conditions of millions of people around the world.

The right to work, enshrined in Article 23 of the Universal Declaration of Human Rights (UDHR), constitutes a central principle to ensure that, even in times of intense technological transformation, everyone can have access to dignified employment opportunities. The growing automation of jobs – especially in industries and service sectors – puts millions of jobs at risk. This results in a paradox between technological progress and increasing precarisation of work.

Hartmut Rosa, in *Alienation and Acceleration: Towards a Critical Theory of Late-Modern Temporality*, describes 'time compression' and 'technical expansion' as central features of a world driven by the imperatives of growth and speed. As the economy accelerates, technology not only transforms production dynamics but also redefines social relations and the experience of time and space.[33] Rosa argues that we are living in a 'late modernity,' marked by a process of social acceleration in three dimensions: 'technological acceleration, acceleration of social changes, and acceleration of the pace of life'.[34]

According to Rosa, technological acceleration 'constantly displaces the spaces of security' that were once guaranteed by stable jobs and continuous careers, creating new forms of insecurity and alienation.[35] This acceleration intensifies the pressures on

[32] Rebechi et al., 'Trabalho decente no contexto das plataformas digitais'.

[33] H. Rosa, *Alienação e Aceleração: Por Uma Teoria Crítica da Temporalidade Tardo-Moderna* (São Paulo: Editora Vozes, 2022).

[34] Ibid., p. 20.

[35] Ibid.

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workers, who face both the insecurity of losing their jobs to machines and algorithms and the difficulty of adapting their skills to new contexts.[36] In this sense, it is crucial to ensure that workers have not only access to jobs but also fair and equitable working conditions, along with opportunities for reskilling and professional development.

The ILO advocates that the protection of fundamental labour rights must include job security and access to decent working conditions. Technological acceleration, while bringing innovation, also exacerbates social inequalities. As Rosa points out, the dynamics of acceleration tend to benefit those already in privileged positions, widening the gap between the rich and the poor.

This issue is reflected in the Fairwork Report in 'Life Stories', where we see workers such as João.[37] João's story clearly illustrates that, in scenarios of labour precarisation, such as those he faces, the principles of Article 23 of the UDHR, which establishes the right to decent work, are violated. This, in turn, impedes the fulfilment of what is guaranteed by Article 25, which ensures an adequate standard of living. In light of this scenario, human rights, such as the right to a safe working environment, fair wages, and protection against unemployment, must be reaffirmed in the contexts of digitalised labour. The regulation of platforms and the inclusion of informal workers in social security networks are necessary measures to combat exploitation and ensure that technology is used to promote social well-being, rather than deepening inequalities.

20.5 ENVIRONMENTAL EDUCATION AS A RESPONSE TO INEQUALITIES AND THE DEFENCE OF HUMAN RIGHTS

Environmental education, according to Reigota, emerges as a response to the need to address the environmental problems generated by the capitalist economic model, which is predatory and unsustainable.[38] The starting point for the environmental discussion occurred at the First World Conference on the Human Environment, held in Stockholm, Sweden, in 1972. This meeting resulted in agreements between the UN signatory countries, emphasising the importance of educating people to solve environmental issues. From this conference onwards, global environmental concern gained prominence, followed by other significant events, such as the Belgrade Conference (1975), Tbilisi (1977), Moscow (1987), Rio (1992), and Rio+10 (2002) in Johannesburg, all of which contributed to the implementation of public policies on environmental education at the international level.

The concerns that gave rise to environmental education were primarily conservationist in nature and often resembled a 'manual of etiquette',[39] with proposals

[36] Ibid.
[37] CPCT, 'Relatório Fairwork Brasil 2023', p. 26.
[38] M. Reigota, *O Que é Educação Ambiental* (São Paulo: Brasiliense, 2004).
[39] J. S. Leite Lopes, *A Ambientalização Dos Conflitos Sociais: Participação e Controle Público da Poluição Industrial* (Rio de Janeiro: Relume Dumará, 2004).

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that were more behavioural than critical of the capitalist system. Initially, environmental education was a concern of ecological movements; however, as the debate deepened, works by authors such as Layrargues and Carvalho became essential in expanding the field's discourse.[40]

In this regard, it is worth noting that environmental education is a constantly evolving field, shaped by socio-environmental issues: 'Refounding the historical, anthropological, philosophical, sociological, ethical, and epistemological foundations of Environmental Education means providing new representations to the signs that these sciences come to symbolise within the horizon of a plurality of knowledge within a unity of meanings.'[41] Considering that we live in a time when crises seem to overlap at a frenetic pace – something we can call polycrises, as reported by Pinheiro and Pasquier – we understand that the necessary debate in the field of environmental education is one that seeks to comprehend the conditions surrounding the emergence of epidemics and pandemics, particularly COVID-19, climate catastrophes, and wars spreading across different parts of the planet.[42] In all cases, there is always a segment of society disproportionately affected by the damages and negative consequences of these processes.

From this perspective, Isabelle Stengers, in her book *In Catastrophic Times*, discusses the relationship between the economic crisis in the US and the devastation caused by Hurricane Katrina.[43] The author asserts that economic and climate crises share a common denominator. Similarly, Henri Acselrad argues that the COVID-19 pandemic, which emerged in 2020, cannot be understood in isolation, but rather as an intrinsic product of neoliberal capitalism.[44] The health crisis emerged in a context already marked by impending financial crisis, resulting in a general collapse of economic activities. For Acselrad, the notions of environmental crisis and disaster must be analysed in light of the processes of capitalist reproduction and crisis.

Carvalho and Ortega support Stengers and Acselrad by pointing to the intertwining of the pandemic, environmental issues, and the climate crisis.[45] In the same

[40] P. P. Layrargues, 'Para onde vai a educação ambiental? O cenário político ideológico da educação ambiental brasileira e os desafios de uma agenda política crítica contra-hegemônica' (2012) 7 *Revista contemporânea de educação* 14, 388–411; I. C. M. Carvalho, 'A perspectiva das pedras: considerações sobre os novos materialismos e as epistemologias ecológicas' (2014) 9 *Pesquisa em Educação Ambiental* 1, 69–79.

[41] C. R. S. Machado, H. Calloni, and G. K. Adomilli, 'Pensares e fazeres sobre e na Educação Ambiental: reflexões sobre/desde os fundamentos ao campo atual Brasileiro' (2016) 21 *Ambiente e Educação* 1, 3–25, at 11.

[42] S. L. Pinheiro and F. Pasquier, 'Consciousness and environmental education: transdisciplinary urgencies from the post-pandemic context' (2023) 14 *Transdisciplinary Journal of Engineering & Science*.

[43] I. Stengers, *No Tempo Das Catástrofes: Resistir à Barbárie que Se Aproxima* (São Paulo: Cosac Naify, 2015).

[44] H. Acselrad, 'Os desastres e a ambientalidade crítica do capitalismo' (2021) 45 *Ciência & Trópico* 2, 89–103.

[45] I. C. M. Carvalho and M. A. A. Ortega, 'Aprendizagens em tempos de fim de um mundo e de abertura de múltiplos mundos. Reflexões desde a educação ambiental' (2024) 23 *Revista Cocar*; Stengers, *No Tempo Das Catástrofes*; Acselrad, 'Os desastres e a ambientalidade crítica do capitalismo'.

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paragraph, the authors reflect on the war between Russia and Ukraine. Therefore, the pandemic, environmental issues, and geopolitical tensions are deeply intertwined, revealing an interconnected global system in which crises not only accumulate but mutually intensify.

Based on Abílio et al., Grohmann, and the Fairwork Report, we add that platform capitalism is an emergent factor within these crises, interconnected within a complex global system in which each crisis amplifies the others.[46] This reality, described as a polycrisis, demands a relational approach, which has already been addressed and to which we aim to contribute through the field of environmental education. From the perspective already emphasised, environmental education must not only address environmental degradation but also the social and political conditions that contribute to these emergencies. Therefore, environmental education must include a critical analysis – based on critical thinking – of epidemics, climate disasters, and conflicts, recognising that their consequences disproportionately affect vulnerable groups.[47] This is an environmental education for environmental justice.[48]

Environmental education provides a conducive space for strengthening the fight against the socio-economic and environmental inequalities faced by workers, especially in the context of environmental crises and technological acceleration. By expanding its boundaries beyond environmental preservation, environmental education becomes a field of study aimed at promoting educational projects in which individuals are engaged in the fight for life in its entirety.

In this sense, Carlos Frederico Loureiro, in his book *Environmental Education: Questions of Life*, places life at the centre of the debate, highlighting the urgency of a utopia that allows the overcoming of the limiting situations imposed by an exclusionary, oppressive system that destroys nature, including humans.[49] Loureiro's view of environmental education is anchored in a broad understanding of the struggle for life. For him, this struggle is not limited to the environmental field but involves transforming the social structures that perpetuate inequalities and the exploitation of workers. He emphasises the need for hope and the imagination of other possible worlds, resisting the logic of a system that generates human misery and environmental destruction.[50]

This conception resonates with discussions on the centrality of life as a fundamental right within the framework of human rights. Rossane Bigliardi and Ricardo Cruz,

[46] Abílio et al., 'Uberização e plataformização do trabalho no Brasil'; Grohmann, 'Plataformização do trabalho'; CPCT, 'Relatório Fairwork Brasil 2023'.

[47] M. Sawada and F. Pasquier, 'Discourses of Japanese history textbooks: from Doxa to critical thinking', in M. Sawada and F. Andres, *Impacts of Museums on Global Communication* (Hershey, PA: IGI Global, 2024), pp. 45–86.

[48] C. F. Santos, L. D. Gonçalves, and C. R. Da Silva Machado, 'Educação ambiental para justiça ambiental: dando mais uns passos' (2015) 32 *REMEA-Revista Eletrônica do Mestrado em Educação Ambiental* 1, 189–208.

[49] C. F. Loureiro, *Educação Ambiental: Questões de Vida* (São Paulo: Cortez, 2019).

[50] Ibid.

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in their article, reinforce this view by stating that the right to life, beyond mere biological existence, includes access to the minimum conditions necessary for the constitution of a healthy and dignified subjectivity, allowing human beings to fully and equitably develop their potential.[51] In this sense, environmental education aligns with human rights education, promoting a praxis oriented towards justice, equality, solidarity, and freedom.

Amorim et al. provide another key reading for environmental education by discussing the need for environmental educators to reflect on the temporal dynamics of contemporary society.[52] In their article 'A resonance of time: the contemporary challenges of environmental education', the authors point out that contemporary time is marked by an acceleration imposed by neoliberal dynamics, which creates challenges for the full development of humanity. According to the authors, environmental education should engage in a resonance of time, rescuing the importance of educational practices that consider the multiple and complex temporalities of human existence and life on the planet, challenging the utilitarian view of time promoted by a society focused on consumption and productivity.

Moreover, they suggest that environmental education needs to reformulate its foundations, taking into account temporal dynamics and how they affect human and environmental relationships. They propose a critical analysis of social temporalities, articulating individual and collective time, and point to the need for new 'synchronisers' that enable formative practices more suited to the complexity of life. This critical reflection on time is also directly connected to the inequalities faced by Brazilian workers in a context of technological hyper-acceleration.[53]

New technologies, by accelerating production rhythms, impose increasing demands on workers, deepen labour precarisation, and exacerbate social inequalities. To address this challenge, environmental education must adopt a perspective that problematises the impact of temporal dynamics on labour relations and society as a whole, promoting a critique of neoliberal models that alienate individuals and fragment their temporal experiences.

Articulating environmental education with human rights is not only possible but also necessary given that both fields share fundamental principles such as human dignity, social justice, and the right to life. Bigliardi and Cruz argue that environmental education, when oriented towards human rights, fosters a civic education that promotes solidarity and cooperation, essential elements for building a more just and sustainable society.[54] Moreover, this education provides workers

[51] R. V. Bigliardi and R. G. Cruz, 'As (im)possibilidades de uma sociedade sustentável e o inextricável embricamento entre educação ambiental e direitos humanos' (2013) 23 *Revista Eletrônica do Mestrado em Educação Ambiental* 1, 22–35.

[52] F. V. Amorim, S. L. Pinheiro, and H. Calloni, 'Uma ressonância do tempo: os desafios contemporâneos da educação ambiental' (2019) 14 *Revista Pesquisa em Educação Ambiental* 1, 48–57.

[53] Ibid.

[54] Bigliardi and Cruz, 'As (im)possibilidades de uma sociedade sustentável'.

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with a critical understanding of structural inequalities and prepares them to face the challenges imposed by a system that commodifies life and destroys nature.

By incorporating human rights principles and placing life at the centre of the debate, environmental education becomes a field of reflection capable of building, together with workers, the necessary tools to confront socio-environmental inequalities and participate in constructing a more just society. As Loureiro, Bigliardi, and Cruz, and Amorim et al. argue, this education goes beyond environmental preservation and involves transforming social structures that perpetuate exploitation and the destruction of life in all its forms.[55] Therefore, environmental education is an education for life and human rights, preparing us for the struggle for a more just and equitable world.

20.6 CONCLUSION

This chapter has sought to provide a critical analysis of technological transformations and their implications for labour, as in Brazil, particularly for the most vulnerable workers. Throughout the chapter, we have discussed how platformisation, precarisation, and algorithmic management – topics emphasised by authors such as Rafael Grohmann, Ricardo Antunes, and Ludmila Costhek Abílio – are reconfiguring labour dynamics, exacerbating inequalities, and excluding millions of people from basic conditions of dignity at work. The phenomena of the gig economy and the uberisation of work have emerged as symbols of this new landscape, in which workers face financial instability, lack of legal protections, and the invisible control of digital platforms.

The chapter has also highlighted the importance of initiatives such as Fairwork, which aim to regulate platform labour and promote fairer working conditions. Regulation and the recognition of digital workers' rights are essential in a context where technological acceleration has deepened exploitation, necessitating new forms of protection and worker participation in decisions that affect their lives.

However, the discussion is not limited to formal labour rights. By connecting labour issues with environmental education, this text broadens the reflection to encompass the right to life in its entirety, integrating social, economic, and ecological dimensions. The struggle for environmental and social justice is intimately connected to the fight for decent working conditions, as both involve the right to a full and sustainable life. Environmental education, when grounded in principles such as justice and solidarity, proposes a critical perspective that goes beyond environmental preservation, addressing the roots of the inequalities that perpetuate the exploitation of workers and the destruction of the environment.

[55] Loureiro, *Educação Ambiental*; Bigliardi and Cruz, 'As (im)possibilidades de uma sociedade sustentável'; Amorim et al., 'Uma ressonância do tempo'.

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In addition, one of the central issues discussed throughout the chapter has been the acceleration of time, a theme explored by Hartmut Rosa. Late modernity is characterised by acceleration in technological, social, and life dimensions, transforming not only labour relations but also workers' experience of time. This acceleration, driven by the neoliberal logic of productivity, fragments temporal experiences and intensifies pressures on individuals, calling for a response that embraces more human and balanced rhythms. In this sense, environmental education can also be seen as a proposal to reclaim a different rhythm of life, one that considers the complexity of natural, social, and individual temporalities, in contrast to the alienation promoted by technological acceleration.[56]

Consequently, this chapter aims to contribute to discussions about technological transformations in the workplace by proposing an integrated approach that links the right to decent work with the right to life and environmental justice. By recognising that the accelerated pace of contemporary life affects not only work but also human and ecological relations, this chapter suggests that any response to the challenges of digitalisation must include a critical analysis of the foundations of environmental education. Only through a broad perspective that comprehends life in its fullness will it be possible to build alternatives that promote a more just, equitable, and sustainable future.

[56] F. Pasquier, D. Galeffi, and J. Collado-Runao, 'Educação transdisciplinar para um mundo complexo', in B. Letellier et al., *IIIe Congrès Mondial de la Transdisciplinarité – Adopter un Langage Transdisciplinaire Commun Face à la Complexité du Monde* (Paris: Rencontres Transdisciplinaires-PlasticitéS, 2024), Vol. IV, pp. 53–98.

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