

## Rural Education and the Challenges of Using Technological Resources in Rural High Schools in the State of Ceará

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### Abstract

This article aims to analyze the progress of Rural Education as a public policy, access to technological development, and the use of its resources in teaching and learning in Rural High Schools located in agrarian reform settlements in the state of Ceará. It is based on documentary research data and theoretical foundations supported by Diniz (2019), Caldart (2004), Almeida (2005/2006), Santos (2016), Molina (2006), Freire (2015/2019), among others. In the first part of this work, we will focus on the historical context of Rural Education. Subsequently, we will present the concept of Rural Education and highlight the differences that exist between Rural Education and other forms of education. Emphasizing these differences is important for understanding the significant role that the rural movement plays in the protagonism of Rural Education for the rural population. In the second part, we will discuss how technological resources are integrated into Education as a pedagogy. In the third part, we will present the challenges of using technological resources in Rural Schools located in agrarian reform settlements. Considering this entire process, we can highlight that the teaching and learning processes, through the integration of technology, are part of the school curriculum, but there are limitations and lack of investments that go beyond the power of the Rural School.

**Keywords:** rural education, technological resources, teaching and learning

### 1. Introduction

The sanitary, economic, and political crisis that has affected the world has greatly impacted the processes of teaching and learning in education. Schools closed their physical structures, but with the resolutions and regulations of the Ministry of Education regarding the new remote high school education, it exposed the inequality in Brazilian education that already existed even with face-to-face teaching. Remote learning deepened the limitations and difficulties in teaching and learning in Brazil, especially in the state of Ceará.

According to the 2020 School Census conducted by the National Institute for Educational Studies and Research (Inep), the numbers demonstrate the inequality in access to technology in Brazilian educational institutions. While 96.8% of private preschools have internet access, this percentage drops to 74.8% in state high schools, and only 66.2% of municipal primary schools in this mode of education have the service. In elementary education, 97.6% of private institutions have access to the internet, while the percentages for state and municipal networks are 99.1% and 64.7%, respectively. In high school, internet access exceeds 90% in all types of schools. However, when it comes to schools located in rural areas, the percentage drops to 52%. The reality goes beyond the data, as there are many rural high schools that are not adequately covered by the research, such as the Maria Nazaré de Sousa High School located in the Maceió settlement in the city of Itapipoca, Ceará.

The data from the Inep research, conducted months before one of the greatest global health crises unfolded, only highlights the deepening of social inequalities in Brazil. When it comes to education, there is a stark disparity. And when we specifically focus on education for the rural population, the reality is even more alarming. Even before the pandemic, public policies for Rural Education, especially in agrarian reform settlements, were already experiencing budget cuts and setbacks under the Bolsonaro government.

As stated in the press release by the National Forum for Rural Education (FONEC), this situation exacerbates the

challenges faced by rural education in ensuring equal access to quality education for all, including the rural population. The lack of internet access and technological resources in rural schools further widens the educational gap, making it even more difficult for students in these areas to access educational opportunities and resources. It is imperative to address these issues and invest in bridging the technological divide to provide equitable education for all, regardless of their geographic location

On February 21, 2020, the Bolsonaro government published Decree 10,252/2020, which altered the institutional structure of the National Institute of Colonization and Agrarian Reform (Incra). More than just changing the organizational structure and positions, the Decree significantly altered the competencies of the agency. The autonomous agency no longer has the authority for policy formulation. All agrarian policies are now subordinate to the Ministry of Agriculture, Livestock, and Food Supply (MAPA), particularly concerning the allocation of public lands, the selection of families for agrarian reform settlements, and the regulation and formation of groups for the identification and demarcation of lands belonging to quilombo communities (FONEC, 2020).

Furthermore, according to FONEC, among the numerous policy eliminations coordinated by INCRA (National Institute for Colonization and Agrarian Reform), the mentioned decree extinguishes the General Coordination of Rural Education and Citizenship, which was responsible for managing the National Program for Education in Agrarian Reform (PRONERA). After 20 years, it eliminates the political space for the development and management of one of the largest public education policies in Brazil.

Regarding internet access, rural territories and agrarian reform settlements are significantly affected, as their access has become much more difficult. Several factors contribute to these limitations, including the remote location from cities, lack of investment, and lack of interest from the government in investing in the progress of these Rural Schools, which were achieved through collective struggle by the Landless Rural Workers Movement (MST) in Ceará. This puts these Rural Schools on the margins of educational development in the state. One of the major problems is the lack of computers with quality internet access and other portable devices such as individual tablets for students to conduct their school research with dignity and have better study conditions.

The achievements of Rural Schools in the state of Ceará are linked to various mobilizations, negotiations, and the confrontation of the capitalist education model that does not represent the reality of agrarian reform settlements. These Rural Schools are seen as a path to strengthen the struggle for land and quality education that considers the interests of rural individuals.

This article was structured with the aim of conducting an initial data collection and analysis of bibliographic materials on the use of technology in Rural High Schools in the state of Ceará.

## **2. Rural Education and Rural Education: Two Different**

**Paths** The history of education in Brazil, in addition to reflecting a sense of domination, is marked by the ideology of urban Brazil, where peasants are seen as a symbol of backwardness. As a result, until 1934, education for rural populations was completely excluded from the educational policies proposed for the country. Even the so-called "rural education" had not been mentioned in the constitutional texts of 1824 and 1891. The educational exclusion of the rural population, therefore, is a historical fact.

The government's concern with rural education in Brazil emerged in the early decades of the 20th century, coinciding with a significant migration flow to industrialized areas. The intention was to encourage the development of rural education in order to keep these populations rooted in rural areas. Thus, the discussion of rural education was closely linked to the debate on the importance of education in curbing rural-urban migration and increasing agricultural productivity. In this perspective, the 1934 Constitution represented a step forward in educational reforms. Its text solidified the understanding of the state as an educator, establishing the three spheres of public power responsible for education. Article 156 of the Constitution states:

The Union, the States, and the Municipalities shall allocate no less than ten percent of the income resulting from taxes to the maintenance and development of educational systems. Sole paragraph. For the provision of education in rural areas, the Union shall allocate a minimum of twenty percent of the quotas intended for education in the respective annual budget. (BRAZIL, 1934, p.35)

Therefore, rural education emerged primarily with the objective of curbing the migration flow from rural to urban areas. At the same time, the implementation of rural education aimed to prepare and qualify farmers to serve as labor for the job market during a period of modernization in the countryside.

The modernization that took place in the Brazilian countryside was exclusionary, benefiting only large landholdings, which led to the exclusion and expulsion of peasants from access to land. Oliveira (2001) draws attention to the increase in violence during this period, resulting from the growing social pressure exerted by

peasants in the struggle for land. "The so-called modernization of agriculture was generating its opposite. As a contradiction of conservative modernization, the struggle for land by peasants was increasing" (p. 192).

Rural education during this period acted as another mechanism of the state with the aim of containing any social movement in the countryside and preparing peasants for wage labor (in the countryside or in the city). In this way, rural education became, in the words of Fernandes (2004), synonymous with "de-ruralization" as it disregards development focused on peasant agriculture and attempts to impose on rural individuals the customs and skills of urban life, disrespecting their culture and traditions.

Indeed, we agree with Meszáros (2005) when he states that:

"Institutionalized education, especially in the last 150 years, has served as a whole to not only provide the knowledge and personnel necessary for the expanding productive machinery of the capital system but also to generate and transmit a framework of values that legitimize dominant interests." (MÉSZÁROS, 2005, p.35)

In this vein, we cannot overlook the fact that historically, the Brazilian countryside has merely reflected the process of colonization, characterized by exploitation and where all interests and services were exclusively oriented towards the metropolis. In this regard, even education was part of this exclusivity. Historically, the social structure of the Brazilian countryside is characterized, on one hand, by large landowners who possess both land and economic power, and on the other hand, by landless peasants.

Under the ideological control of the ruling classes, agricultural education plays a role in adjusting and preparing the workforce to participate in the ongoing agro-industrial development project in the country. Its objectives focus on the diffusion and innovation of technologies and the transformation of labor relations (MOLINA, 2006, p. 44).

As a critique of rural education and with the aim of defending the development of the peasant class and rural populations, the Landless Workers' Movement (MST) has been fighting throughout its trajectory for Education of the Countryside. This type of education seeks to cultivate the identity of rural men and women by linking their struggles, dreams, values, culture, and history to the educational process.

Social movements in rural areas, especially the Landless Workers' Movement (MST), discuss the issue of education, considering the need for a new educational proposal focused on their specificities. Therefore, this movement, in addition to the struggle for land access, also advocates for the fight for education, understanding that the struggle for land is intertwined with the struggle for education and schooling for a population historically excluded from public policies (DINIZ, 2019, p.328).

As highlighted by Cardart (2007), Rural Education emerged through the mobilization and pressure of peasant social movements for an educational policy for rural communities. It was born from the combination of the Landless Workers' struggle for the establishment of public schools in Agrarian Reform areas and the resistance efforts of numerous peasant organizations and communities to prevent the loss of their schools, educational experiences, communities, territory, and identity.

Initially, in the struggles of peasant social movements, particularly the Landless Workers' Movement (MST), they believed that organizing to fight for schools was just another one of their struggles for social rights, rights from which they were being excluded due to their condition as landless workers.

Rural Education is built upon a contradiction that arises from the very class contradiction in rural areas: there is an inherent incompatibility between capitalist agriculture and Rural Education because the former thrives on the exclusion and demise of peasants, who are the primary subjects of the latter. In our discourse, this has been referred to as the main opposition to rural education or education for rural areas, which historically has been the term used to describe state initiatives aimed at shaping the education of the rural working population in a way that obscures this contradiction, making it an object and an instrument for implementing policies and agricultural models conceived elsewhere and serving interests other than their own as a social group, class, and individuals (MOLINA, 2004, p.13)

However, throughout the struggles for rights and social justice, the MST realized that Rural Education went beyond providing schools for their settlements; it was a more complex endeavor. Firstly, because there were, and still are today, many other working families in rural and urban areas who also lacked access to this right.

The MST School is one that embraces the movement of these pedagogies, developing pedagogical activities that take into account the various dimensions of human formation. It is a school that humanizes those who are part of it. And it can only do so if it places the human being at the center, as a subject of rights, as a being in construction, respecting their temporalities. Our task is to educate individuals who are aware of their human rights, of their dignity. We cannot treat those who are educated as commodities to be sold in the labor market. That would

dehumanize them and all of us (BENJAMIN, 1999, p.34).

We agree with Fernandes (2005) that Rural Education as a public policy is not in the interests of agribusiness because this territorial dimension is not included in its development model. Research for agribusiness is an important sector for the creation of technologies aimed at improving the various products in its intricate chain of commodity processing and cheap labor. Large agribusiness companies have connections with major public universities and research institutes, where some of their professionals and researchers are trained. They also maintain their own research institutes, which ensures significant autonomy in technology production

According to Santos (2016, p.5), education for the MST is an explicitly relevant process in shaping consciousness and driving it towards transformative action in reality. Therefore, the MST establishes organizational sectors and alliances that discuss, produce, and support the implementation of education as a process in settlements and encampments.

It is important to emphasize that the entire process of constructing rural education has occurred through intense struggle by the organized peasants in the MST, who still represent the daily resistance to ensure quality education for all peasants. Caldart (2004, p.29) asserts that "Rural education must be the expression and movement of peasant culture transformed by the social struggles of our time." In other words, education in practice must be realized through pedagogical interventions that bring forth differences, intentions, individual and social values, and unity among subjects, in order to create a culture of resistance and overcoming rather than accommodation based on inequalities.

This education is based on the teachings of Paulo Freire, who explains that education is a political act:

Education is both a political act and an act that educates politically. It is not possible to deny, on the one hand, the positivity of education and, on the other hand, the educative nature of the political act. In this sense, every party is always an educator. It depends on what kind of education that party engages in, who it is with, and what it stands for as an educator. If education is always a political act and educators are political beings, it matters to know whom we are doing politics for, what our choice is [...] Liberating education is either a constant adventure or it is not creative. And there is no creation without risk; what we have to do is reinvent things (FREIRE, 2012, p.29).

Therefore, rural education plays a role in contributing to social transformation. We cannot forget that we live in a country burdened with social inequalities, and it is only through social transformation that passes through the educational path that we can contribute to a dignified life for the individuals who live and inhabit rural areas. This education is designed by these social subjects, as analyzed by Caldart (2004), to build education for the rural people, not just with them or for them.

### **3. Education: Use of Technological Resources for Teaching and Learning**

The development of technology is becoming increasingly present in the daily lives of society. Information and communication technology (ICT) is already part of the reality of thousands of Brazilians, especially in urban centers. In terms of education, technology is being slowly introduced with many limitations in terms of investment in technological resources, particularly in public schools in the country.

The process of technological integration in Brazil is related to the historical context of the Industrial Revolution. According to Osni and Mengarelli (2011), the emergence of machines in various sectors of production, supported by capitalism, led to a growing technological advancement and the need for increasingly skilled workforce in the job market. With these transformations, technological progress has intensified and expanded the boundaries of communication, leading to the presence of technology in the daily lives of society, whether in cities or in rural areas. And thus, technology has entered the educational space, initially through television and VCRs, and more recently through the use of computers

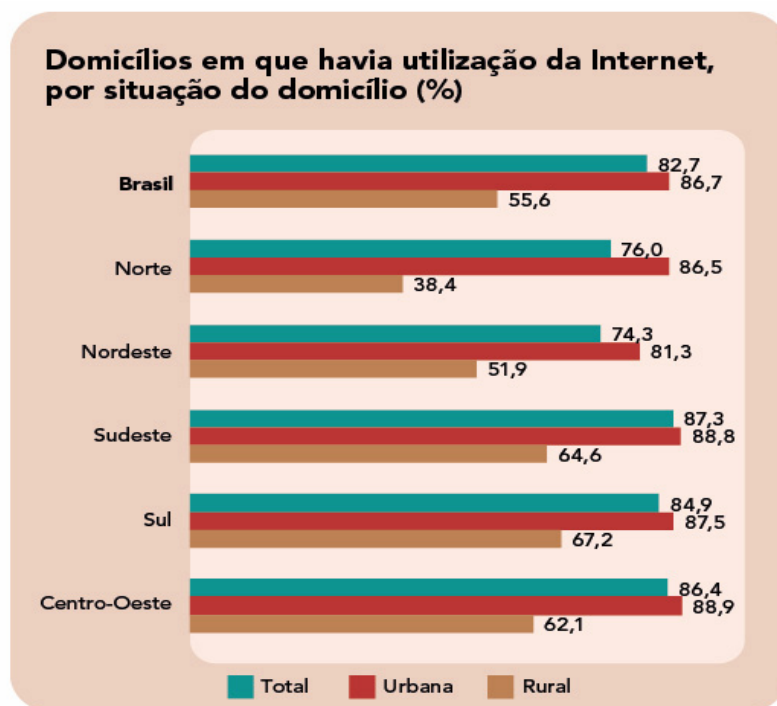
According to Almeida (2005/2006), the processes of technological innovation, especially information and communication technologies (ICT), are integrated into the daily activities of all sectors, highlighting new ways of communicating, working, and producing knowledge. These innovations bring about radical transformations in conceptions of science, society, and education.

Education, when combined with technology, can be seen as a tool, as a set of resources in the service of individual development, emphasizing the value of human beings in their life reality. Through learning about and interacting with technology, individuals can develop skills, acquire knowledge, and even basic concepts that assist them in their daily lives (Osni and Mengarelli, 2014, p.06).

### **4. Results and discussions**

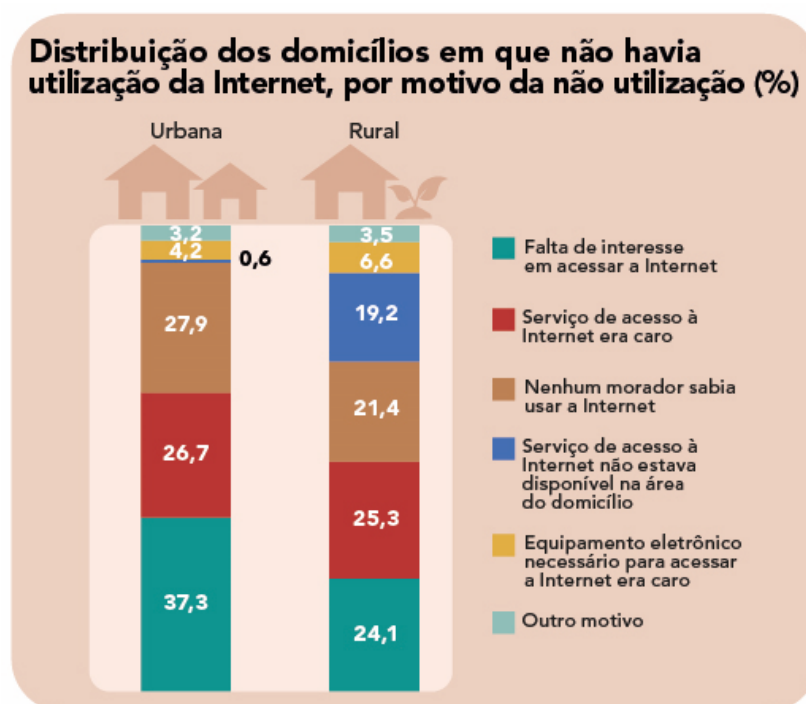
According to the National Household Sample Survey (PNAD) conducted in 2019, 82.7% of Brazilian households

used the Internet. The majority of these households are concentrated in urban areas of the country's major regions, as shown in the graph below



Fonte: IBGE, Diretoria de Pesquisas, Coordenação de Trabalho e Rendimento, Pesquisa Nacional por Amostra de Domicílios Contínua 2019.

Considering the data from the Brazilian Institute of Geography and Statistics (IBGE) and our information gathering through visits to Rural Schools and interviews, it can be affirmed that, on average, 55.6% of the rural population in the state of Ceará does not have access to internet networks or technological devices to make use of technology.



Fonte: IBGE, Diretoria de Pesquisas, Coordenação de Trabalho e Rendimento, Pesquisa Nacional por Amostra de Domicílios Contínua 2019.

There is evidence and data that confirm the disparity in access to technology, especially the internet, in Brazil, and the reality in rural areas accentuates the inequality in technological resources. This reality needs to be overcome through the expansion of public policies aimed at increasing investment and providing continuous training for teachers and technical staff in schools, with a focus on technology as a pedagogical tool for teaching and learning. However, this should not overshadow the role of teachers using traditional teaching methods, but rather integrate technological resources as part of individual and collective knowledge development.

### 5. Use of Technological Resources in Rural Education

The integration of technological and digital resources in rural schools is still a slow process, far behind the urban reality. All rural schools in the state of Ceará have computer labs, science and research labs, video labs, and internet access in their facilities. However, due to the location of the schools within the settlements, where internet signal is still somewhat challenging, there are limitations in the use of computer labs.

The potential of digital technology, as already highlighted, is not sufficient to guarantee learning, nor does it indicate that a single technology is suitable for all educational situations. The purposes of the activity, contextual needs, study topics, and strategies to be developed are the indicators of which technologies should be integrated or whether it is appropriate to use technologies in a particular educational situation. (ALMEIDA, 2006, p.04)

During the peak of the pandemic in 2020 and 2021, schools made efforts to adapt to the available resources in order to continue their classes. Like other public schools, they attempted to access digital technology resources to share knowledge and ensure that students did not miss out on classes and content. The most effective method found by teachers, in collaboration with the school administration, was the use of the WhatsApp application. This app was chosen because it is lightweight, easy to use, and the most commonly used communication tool by young people and the general population.

According to Almeida (2018), WhatsApp is an application that is gaining increasing popularity among people, including within schools. It is becoming more and more present in the daily lives of young people and adolescents in high schools.

In the context of rural education and learning, it is essential to understand the potential of information technologies in terms of collective knowledge development. It is an important tool for debunking the myth that rural areas and rural schools are excluded from development. The rural areas also require access to technology, and the challenge lies in ensuring that it reaches these individuals.

The pandemic has highlighted the limitations of remote learning, which go beyond access to technology and the internet. It also puts a significant burden on families. While remote learning presents an opportunity to develop skills, establish routines, and become more involved in their children's learning process, these opportunities are not always favorable in disadvantaged environments (OLIVEIRA, GOMES, & BARCELLOS, 2020).

Rural areas have the right to quality education that provides the necessary conditions to value the territory and access resources that strengthen teaching and learning. This right is guaranteed by the Resolution CNE/CEB 1, of April 3, 2002, which establishes Operational Guidelines for Basic Education in Rural Schools. Article 2, paragraph 1, states that:

"The identity of rural schools is defined by their connection to the inherent issues of their reality, anchored in the temporality and knowledge of the students, the collective memory that points to the future, the network of science and technology available in society, and social movements that defend projects that link the solutions required by these issues to the social quality of collective life in the country" (BRASIL, 2001).

It is understood that rural schools play an important role as a reference for new teaching and learning approaches. While there are limitations that are gradually being overcome, such as access to technological resources for rural schools, they also have alternatives to work with new technologies through interdisciplinary projects and research activities related to agroecological and agro-industrial development.

Your curriculum, due to its diversity, goes beyond the national common base and includes Curricular Components as a way to diversify the Curriculum Framework, which encompasses the diversified part of this curriculum. This strategy aims to ensure the school's full-time presence by coordinating pedagogically research, work, and social intervention.

In this sense, the integrative curricular components that make up the diversified base of the Curriculum Framework in High Schools in rural areas and were collectively defined are: Project Studies and Research (PEP), Work Organization and Productive Techniques (OTTP), and Community Social Practices (PSC). These components are

included in the curriculum framework to introduce a new formative logic into the daily lives of students through their involvement in research. Considering that work is the key factor for students to have the necessary conditions to intervene socially in the communities they are part of.

## 6. Considerations

The educational model in Brazil has been marked by the exclusion of rural areas as places entitled to quality education and the valorization of their culture. Rural Education aims to break the barriers of an education system dominated by large landowners, providing new teaching methodologies specifically tailored to the needs of rural populations. Education has become one of the struggles of the rural movement, fostering an approach that combines techniques with the construction of teaching and learning projects that incorporate technology into the lives of rural students.

Through readings and research of documentary materials, it becomes evident that there is a scarcity of materials on rural education and the use of technological resources. This highlights the need for further research and writing on these topics, showcasing how the rural movement for Rural Education aligns its values and principles with the societal development model and access to all available technologies.

It is no longer acceptable to claim that rural areas are places of backwardness that do not require access to technology. The social and technological development should not prioritize cities over rural areas. Social policies need to reach all territories equally to reduce social inequality, providing access not only to technologies but also to the necessary conditions for survival, the valorization of agroecology, family farming, and the productive technologies developed in the Agrarian Reform Settlements of the Landless Workers' Movement (MST).

Therefore, Rural Schools include technology as a pedagogical resource in their curriculum. However, they still face barriers to internet access in the settlements where the schools are located. The limited access to the internet in households is also a constraint that needs to be overcome. As the MST asserts, there can be no achievement without struggle, and the fight for better conditions of access to teaching and learning is a daily endeavor within the movement

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