



Freirean inspirations in solidary internationalism between East Timor and Brazil in science education

Suzani Cassiani¹ · Irlan von Linsingen¹

Received: 30 January 2023 / Accepted: 30 January 2023 / Published online: 4 March 2023
© The Author(s), under exclusive licence to Springer Nature B.V. 2023

Abstract

The aim of this work is to reflect on the challenging trajectory of international cooperation between East Timor and Brazil, which focused on the need to rethink teacher education from a critical intercultural perspective, aiming to build emancipatory relations, love, and solidarity. From 2009 until 2016, we coordinated the Qualification of Teachers and Teaching of the Portuguese Language program in East Timor, inspired by the dialogicity of Paulo Freire, an educator well known and beloved by the Timorese people for his indirect contribution to the independence of that country. Freire's dialectic denunciation-announcement was essential to identify the problems and propose solutions *with* the Timorese and not only *for* them. In addition, through our experiences in that country, we identified issues like those of Brazilian education as the effects of coloniality and introjections of inferiority and subordination, as well as the transnationalization of education, among other problems. Thus, the Freirean dialectic denunciation-announcement of this praxis, together with Timorese education, drove us to examine our own Brazilian territory, provoking intersectional reflections related to racism, gender and sexuality issues, and social class prejudice, among other forms of oppression. It deepened ways of acting based on critical interculturality and the concept of decolonial pedagogy, which suggested ways to fight for social justice in science education.

Keywords Science education · Anti-racist education · Effects of coloniality · Decolonial pedagogy · Freirean pedagogy

Resumo

O objetivo deste trabalho é refletir sobre a desafiante trajetória de uma cooperação internacional entre Timor-Leste e Brasil que focou na necessidade de repensar a formação de pro-

This manuscript is a part of the special issue *Reflecting on Freire: A praxis of radical love and critical hope for science education*, guest edited by Betzabe Torres Olave, Sara Tolbert, and Alejandra Frausto Aceves.

✉ Suzani Cassiani
suzani.cassiani@ufsc.br

Irlan von Linsingen
irlan.von@gmail.com

¹ Graduate Program in Scientific and Technological Education, Federal University of Santa Catarina, Florianópolis, R. Eng. Agrônomo Andrei Cristian Ferreira, s/n - Trindade, SC 88040-900, Brazil

fessores em perspectiva intercultural crítica, visando construir relações emancipatórias, de amor e solidariedade. De 2009 a 2016, coordenamos o programa de Qualificação Docente e Ensino de Língua Portuguesa, em Timor-Leste, inspirados pela dialogicidade de Paulo Freire, um conhecido e amado educador do povo timorense, por sua indireta contribuição na independência daquele país. A dialética freireana denúncia-anúncio foi importante não só para enxergarmos os problemas, mas também para propormos soluções com os timorenses e não somente para eles. Além disso, em nossas experiências naquele país, identificamos problemas semelhantes aos da educação brasileira como efeitos de colonialidade, introjeções de inferioridade e subordinação, transnacionalização da educação, entre outras denúncias. Assim, a dialética freireana denúncia-anúncio dessa práxis, junto à educação timorense nos fez olhar para o nosso próprio território brasileiro, provocando reflexões interseccionais relacionadas ao racismo, às questões de gênero e sexualidade, ao preconceito de classe social, entre outras diferentes formas de opressão, aprofundando modos de agir tendo como base a interculturalidade crítica e o conceito de pedagogia decolonial, a qual anunciou caminhos para a luta por justiça social na educação científica.

Palavras chaves Educação em Ciências · Educação Antirracista · Efeitos de Colonialidade · Pedagogia Decolonial · Pedagogia Freireana

This article aims to reflect on some aspects of the trajectory of the international cooperation between East Timor and Brazil. From 2009 until 2016, we coordinated the Qualification of Teachers and Teaching of the Portuguese Language (QTTPPL) program in East Timor, which each year sent 50 Brazilian educators to live in Timor-Leste to prepare lay Timorese teachers.

The article focuses on the need to rethink teacher education from a decolonial and intercultural perspective, aiming at constructing emancipatory relations of love and solidarity inspired by the dialogicity of Paulo Freire.

Decolonial studies have taught us how the hierarchization of cultures promoted genocide and subordinated entire peoples, and the need to counteract oppression.

Like Brazilians, with a history of colonization like Timor-Leste, it was important to know these social phenomena, which motivated our actions. Therefore, we understand that it is fundamental that the history of the liberation struggle is told by the colonized to decolonize hearts and minds. Finally, we present some Freirean influences on actions and investigations of the education of science teachers in East Timor and its consequences.

First steps

From 2009 to 2016, we coordinated the Qualification of Teachers and Teaching of the Portuguese Language (QTTPPL) program in East Timor, an international educational cooperation funded by the Brazilian federal agency Coordination of Superior Level Staff Improvement, under the supervision of the Ministry of Education and Foreign Affairs and the Timorese Ministry of Education.

This international cooperation was managed by Brazilian entities and started in 2005. It was a foreign policy of the governments of President Lula da Silva and President Dilma Rousseff based on South–South cooperation. The QTTPL program aimed to send missions with 50 Brazilian educators annually so that they could contribute to teacher education in East Timor as well as the implementation of the Portuguese language, which was banned for 24 years during the Indonesian invasion. After East Timor’s independence in 2002, further problems arose due to the vast cultural invasion of international partners, bringing other challenges.

East Timor is a small island in Southeast Asia that Portugal controlled from 1512 until 1975. In 1975, Indonesia invaded the country, culminating in a genocide that lasted 24 years. Anselmo Xavier, a Timorese who lived and attended school during that time, tells us:

I went to pre-secondary education which lasted from 1988 to 1992, in the Uato-Carbau Subdistrict. The place where I studied was four kilometers from my house, and walking was the only way to get around. We had science, biology and physics classes, taught by the Indonesian police (POLRI), who went to schools in uniform and armed, in addition to other language, social sciences, arts, mathematics and physical exercise teachers. That situation formed a context of oppression because education was represented by teachers and the police. (Xavier 2016, p. 31)

In 2000, when Indonesia was expelled from Timorese territory, at least two groups became teachers: those who spoke a little bit of Portuguese but did not have academic credentials, and those who had a university degree but spoke only the Indonesian language. About 80% of the teachers who worked in primary schools had no academic background. The first author of this article took a particular interest in East Timor beginning in 1996 when she watched Noam Chomsky on a television program denouncing the genocide of the Timorese people and the prohibition of the Portuguese language. Chomsky asked why Brazil, a country that also spoke Portuguese, did not offer solidarity with East Timor.

When the Brazilian government invited our Federal University of Santa Catarina (Florianópolis, Brazil) to work with the QTTPL program, we believed our work could contribute to this new context of peacebuilding in East Timor. Since the 1980s, after the end of the Brazilian military dictatorship, our previous teaching and research work in science education and teacher education had been grounded in a critical approach, strongly inspired by Paulo Freire. Therefore, this critical approach required us to reflect upon local themes relevant to our students’ daily understanding and interrogate how science education could help to develop critical thinking and political awareness in a Latin American country of continental dimensions such as Brazil (Cassiani and Linsingen 2009).

As Freire said, “every cultural invasion presupposes the conquest, manipulation, and messianism of those who invade” (1968, p. 27). We did not want to take that risk in East Timor, because Paulo Freire’s legacy indicated that it was necessary to work *with* teachers and not simply *for* them.

Our admiration of East Timor was even greater knowing the history of the tenacious and bloody struggle for independence of the Timorese people, its epistemic resistance, and its decolonial power against the genocide caused by the Indonesian occupation. Our respect and regard grew as we met intellectual teachers who had engaged in an

armed struggle for independence. For us, these experiences were a gift from life. At the same time, we felt a great responsibility to avoid, as much as possible, reproducing the *modus operandi* of colonization. Although we were excited about the prospect of contributing to the reconstruction of East Timor, we could not have imagined at the time how much we would also learn about Brazil.

Initially, many questions were present: How could we teach science to teachers without pedagogical education, who did not speak the Portuguese language? How could we understand our role as educators without falling into the trap of vertical knowledge transfer? How could we act in partnership without creating dependency and subalternation?

When we arrived in East Timor, our decolonial shift began. For us, this shift meant a process of developing and growing our theoretical and practical, political, and epistemological resistance to the logic of modernity/coloniality, to which individuals have historically been subjected in both Brazil and East Timor (Cassiani 2018).

Freirean inspirations

Freire's books served as profound inspiration for our first dialogues with East Timor. Two of these books are based on Freire's experiences abroad, in Chile and Guinea-Bissau: *Extension or Communication?* (1968) and *Letters to Guinea-Bissau—Records of an Experiment in Process* (1978). Also, while in exile in Chile, Freire wrote *Education as a Practice of Freedom* (1967) and his main work, *Pedagogy of the Oppressed* (1970). These books were fundamental for us to understand what cultural invasion meant, the hierarchical work in the university practice, and the impact of colonization that created economic dependence, enslavement, and subalternation of native peoples.

In 1964, after the beginning of the military dictatorship in Brazil, Freire was imprisoned for 72 days. In September of that year, he left Brazil with his family, and began working with the Chilean Institute for Agrarian Reform. In an interview with Friar Betto (1996), he described how exile was a learning moment:

When I was exiled, I distanced myself from Brazil. I began to understand myself and understand it better [...]. It took distance from what I did by assuming the provisional context to understand what I did. I could better prepare to continue doing something for my context and prepare for a possible return to Brazil.

For our part, Freire had taught us in his book *Extension or Communication?* (1968) some ways of knowing other contexts, distanced from our culture, without trying to impose our views. Freire's ideas contributed greatly to our understanding of what the Brazilian cooperation with East Timor could be. First of all, it was necessary to know how the invaders produced subalternation, dependence, and epistemic coloniality, as well as how Timorese resisted through anticolonial counter-hegemonic activities and the struggle towards independence.

In reading these works by Freire, we became increasingly committed to hearing from Timorese people about their histories and their ways of seeing Western science, with attention to potentially silenced knowledge. Our goal and purpose for the collaboration moved toward a non-hierarchical recognition of differences, and the co-construction of new knowledge.

After his time in Chile, the United States, and Switzerland in the 1970s, Freire was invited to participate in international critical educational projects in other countries. With internal resistance in the African colonies and the Carnation Revolution in Portugal, several territories gained their independence, including Timor in Southeast Asia and Guinea Bissau in Africa. In Guinea Bissau, Freire (1978), through his work in adult literacy and teacher education, taught us what authentic help is: a mutual involvement of actors in a practice of simultaneous transformation, such that “the act of helping is not distorted in the domination of what helps over those who are helped” (p. 11).

These ideas were crucial to our relationship of partnership, rather than assistance. Because as Brazilians we also had a colonized country, we were able to identify many similar problems in Brazilian education, such as lingering inferiority and subordination resulting from colonization, as well as colonial education systems based on the transfer knowledge and imposition of specific ways of thinking, including about education itself.

Reflecting on the shared experiences of coloniality (and decoloniality) between East Timor and Brazil provoked a kind of solidary internationalism, versus assistencialism. We learned from Paulo Freire that it was necessary to enact an anticolonial stance in countries of the Global South. It was also important, however, to consider the nature of international cooperation in terms of South–South relations, for example on the internationalization strategies of Brazilian universities, i.e., as a kind of public policy that aims to connect Brazilian researchers to other countries in the name of a solidary internationalism (Cassiani, Pereira and Linsingen 2016).

In *Letters to Guinea Bissau* (1978), this quote touched us deeply:

It was an absolute priority that Guinean students should study their own geography and not that of Portugal, the inlets of the sea and not the Rio Tejo. It was urgent that they study their history, the history of the resistance of their people to the invader and the struggle for their liberation which gave them back the right to make their own history, and not the history of the kings of Portugal and the intrigues of the court. (p. 20)

It is interesting to note the similarity of that Freire speech with the words of the Timorese Minister of Education Armindo Maia, in 2005, as reported by a Brazilian woman, a member of the QTTP program who worked during the beginning of the Brazil-Timor cooperation. When she and another colleague asked for resources to produce teaching and learning material, Armindo Maia agreed and answered:

I know the names of all the rivers and mountains of Portugal, its history and politics and have never seen our written history, the terms of our rivers and mountains, the geography and culture of our country in any book in our schools. This is my greatest dream, to see reality in the books of our schools.

The ideas of Paulo Freire and Timorese Minister Armindo Maia reveal to us how the silencing of local culture, and the exaltation of European culture, brought alienation, feelings of inferiority, the extinction of native languages.

For Freire (1978), the prominent colonial heritage left by the Portuguese in Guinea Bissau was *desafricanization*, a colonialist ideology that sought to instill in children and young people “the profile of inferior, incapable beings whose only salvation would be to become ‘white’ or ‘black with white soul’” (p. 15). Five centuries of “modernity” in Guinea Bissau resulted in 90% to 95% of the population being illiterate in 1975.

Franz Fanon's book *The Condemned of the Earth* and Albert Memmi's (1977) book *The Colonizer and the Colonized* (French: *Portrait du colonisé, précédé par Portrait du colonisateur*), were important to reinforcing a dehumanization concept, in an anticolonial attitude, fighting alienation:

Dehumanization, which marks not only those whose humanity has been stolen but also (though in a different way) those who have stolen it is a distortion of the vocation of becoming more fully human. (Freire 1970)

In *Letters to Guinea Bissau* (1978, p. 6), Freire includes a dedication to Amílcar Cabral, a hero of the Guinean revolution, with the following words: "Dedicated to the memory of Amílcar Cabral, educator, who learned from his people." On his revolutionary politics, Amílcar Cabral stated,

I may have my opinion about many things, about the way to organize the struggle; the way to organize the Party; an opinion, for example, that I formed in Europe, in Asia, or in some other country of Africa, from reading books or documents, from meetings which influenced me. I cannot, however, pretend to organize a Party or a struggle based on my own ideas. I have to do this starting from the reality of the country. (Freire 1978 *apud* Cabral p. 6)

The discourse of the colonizer can be perceived in an old children's textbook from Portugal in the 1960s, when the authors showed that the history of the colonized began with the civilizing presence of the colonizers. In that book there is the discourse that Portugal was not a small country, but rather described as owner of three territories—mainland Portugal, island Portugal, and overseas Portugal:

Portugal is our homeland, the country where we are born, we live and work. It is not a small country because beyond the continental territory, with 89,000 square kilometers of surface, it also has, spread around the world, other territories, with more than two million square kilometers. [...] Overseas Portugal is formed by the territories of Cape Verde, Guinea Bissau, Sao Tome, Principe, Angola and Mozambique, States of India, Macau, and Timor. All of them are linked to the Motherland by centuries of bonds. Such ties are so strong that Mainland, Insular and Overseas Portugal constitute a single nation, large and well united, populated by more than twenty million Portuguese. (Portugal 1960, p. 8–9)

It is interesting to note that, despite the pompous name given to the colonies (i.e., overseas Portugal), there is a tendency to naturalize and mask the invading presence of the Portuguese. Even today, it is possible to observe how colonial discourses are presented as "innocent," disguising (and perpetuating) colonial violence and erasures. For example, on platforms such as Wikipedia, the invasion of Europeans in the American, African, and Asian territories is described as a joyous event because it brought modernity to the original peoples. As Freire noted in Guinea Bissau:

The inherited colonial education had as one of its principal objectives the de-Africanization of nationals. It was discriminatory, mediocre, and based on verbalism. It could not contribute anything to national reconstruction because it was not constituted for this purpose. (1978, p. 15)

It is important to emphasize that the living conditions and rights of the peoples of origin, whether Guinean or Timorese, were not equal to those of the Portuguese. So, what

have modernity, progress, and development actually brought to those that the Portuguese decided to colonize? And to what extent have we internalized these effects of coloniality?

Antero Silva (2016), a Timorese professor and human rights activist, warns us of three types of colonial heritage in East Timor: (1) an educational elitism, during which, in 1940, education was for the few, despite being “public” and under the purview of the Catholic Church; (2) linguistic policy, in which the native Timorese language Tetum was not employed in schools by the colonial state; and (3) Portuguese cultural hegemony and educational inequality to maintain dominance over the Timorese people. For example, in 1974, less than 20% of the population were literate. These imposed colonial customs still exist, for instance, when only Portuguese names are allowed in birth records.

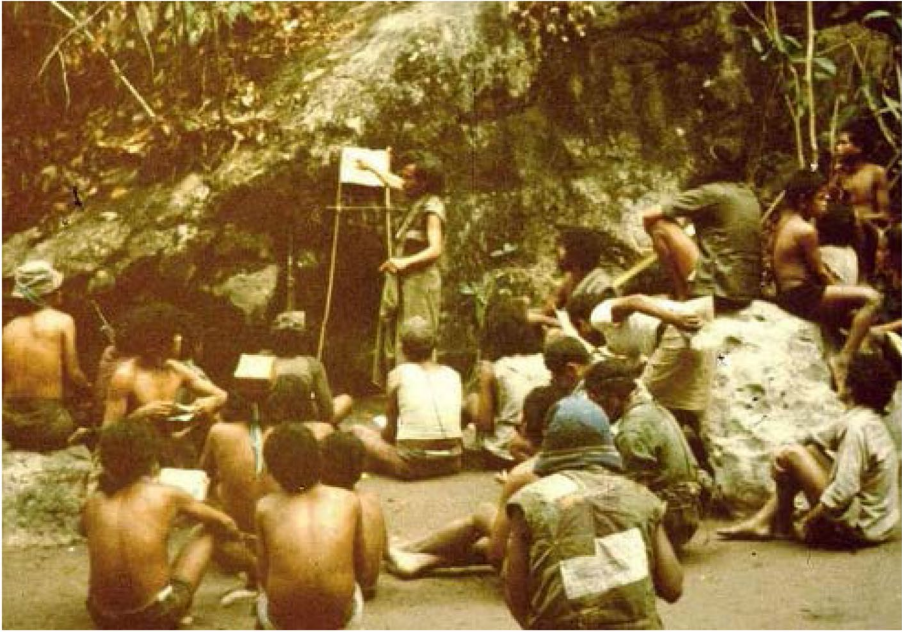
Colonialism and this colonial heritage of education were designed to foster a sense of inferiority in youth that still remains. Timorese writer Domingos Sousa in his book *Colibere* (2007) describes that feeling:

Going to school meant learning everything that was from the outside. In the mentality of Colibere and his compatriots, a complex of inferiority was created in the face of their own culture. They were ashamed of their own culture. Likewise, he also learned religious songs in Portuguese and Latin, which he often sang with great devotion, although he did not understand anything. [...] When someone unknown appeared in the village and from Dili, Colibere was called to communicate with him and be his interpreter. I was proud to know how to give some touches to the Portuguese language. His parents were proud of their son because he was the only one who could communicate with other people in a language that those in his village did not know. To talk in Portuguese gave him prestige and, at the same time, introduced him to the elite class. (2007, p. 51)

These effects of coloniality establish links between the past and present and emerge from a pattern of power in capitalism and the patriarchy that affects gender and coloniality.

It was in the 1970s that the Timorese stories with Freire intersected. The National Liberation Front organized a Freirean literacy-based popular education campaign as one of the outlets for supporting the development of political consciousness among the Timorese (Silva 2016) and the production of medicines and equipment for those fighting in the guerrilla group as paramedics.

Samuel Urban, Irlan Linsingen, and Antero Silva (2020) explain that the book *Pedagogy of the Oppressed* arrived in East Timor through students who had studied in Portugal in the 1970s when several Portuguese colonies were clamoring for independence. *Kuda* was a “generative word” for literacy. In the Tetum language it means “horse,” which was a prevalent animal in Timor. The authors tell us that *Kuda* is also found in a revolutionary song entitled *Foho Ramelau*. In English: “Awake, hold the reins of your horse. Awake! Take control of our own country!” *Kuda* is a symbolic concept for explaining the power relations and was used as a keyword in the Frente Revolucionária de Timor-Leste Independente (Revolutionary Front of Independent East Timor [FRETELIN]) literacy manual *Rai Timor, Rai Ita Nian* (The land of Timor is our land).



Source: Museu da Resistência Timorense, Díli, East Timor.

Paulo Freire's anticolonial stance contributed to our reflecting on the problems and opportunities we face in East Timor, Brazil, and other Latin American countries.

The learning with this country took our research group at a Brazilian university to other horizons, including the construction of educational alternatives in science education, toward social inclusion in countries with fragile social and economic situations, and deepening intersectional, anticolonial struggle and decolonial pedagogies. These theoretical perspectives have contributed to our thinking about forms of science education that prioritize the fight against racism, homophobia, and social class prejudice, among many other forms of oppression, in Brazil (Cassiani and von Linsingen 2019).

Over the years, our research has focused on science, technology, and society (STS), education, and French discourse analysis (Orlandi 2005), to investigate what kind of science and technology is vital for the Global South. A key priority for our work is to identify the resolution of local problems through science and technology education (Bianchetti, Linsingen and Cassiani 2019). In addition to Paulo Freire's liberatory education, we are inspired by the scholarship of the decolonial turn (Castro-Gomez and Grosfoguel 2007; Grosfoguel 2008 2016; Quijano 2010; Walsh 2017), whiteness and racism (Fanon 1961; Schucman 2014), epistemologies of the South (Santos and Meneses 2010), intersectionality (Collins 2019), and interculturality (Fleuri 2004), among others.

The Freirean dialectic denunciation-announcement to rethink science education and teacher education

The Freirean dialectic was inspiring for our Brazilian educational cooperation with East Timor for at least two reasons: the collaboration critically raised daily life problems (denunciations) and proposed solutions that moved us towards transformative education (announcements).

The problems we experienced were many and varied: the pain of teaching subjects to teachers who did not speak the Portuguese language; the absence of teaching materials; the silencing of local knowledge; our ignorance about East Timor's reality and culture; some hierarchical relations between Brazilian cooperators and Timorese teachers; the local precariousness of the schools; and interpersonal conflict between Brazilians.

Concerning the announcements or search for solutions to constructed/identified problems, that is, paths to be taken, these included *doing with them and not for them*, understanding and valuing cultures, and recognizing the transformations resulting from intercultural relations, local knowledge, and our historical realities, as well as breaking with hierarchies that subordinated, bringing hope and knowledge of themselves.

The QTTPL program began in 2005, but it was not until 2009 that the Federal University at Santa Catarina (Brazil) initiated the coordination, finishing in March 2016. Despite East Timor wanting to continue the program, it was not renewed, as it was not approved by the Brazilian government, which was coincidentally the same year as the state coup of Brazilian President Dilma Rousseff.

The QTTPL program aimed to send 50 Brazilian educators from different areas, contributing to initial and continuing education for lay teachers of basic education, from the initial years to secondary education (emergency bachelor's degree and Portuguese language teaching).

When the first phase had finished in 2011, i.e., emergency bachelor's degree, we proposed an amplification of the actions: support to higher education at the National University of Timor-Lorosa'e, and cultural activities outside the school (movies, capoeira, reading and poetry workshops).

The following table shows the number of actions since 2009, with 13330 attendances, remembering that in 2016, Brazilians stayed for only three months.

General attendance at East Timor by Brazilian educators board

Activities					Attendance				
Year	2009	2010	2011	2012	2013	2014	2015	2016	Total
Initial and continuing education of teachers at schools	500	500	450	There was no mission because of a new signing of the cooperation agreement	25	228	180	37	470
Promotion in Portuguese language teaching	–	–	–		384	459	349	–	1192
Support for higher education at university	–	–	–		454	3762	2841	408	7465
Cultural language promotion (movies, capoeira, reading and poetry workshops, etc.)	–	–	–		1305	308	1140	–	2753
Total	500	500	450	–	2168	4757	4510	445	13,330

v56321fgdf752445

Many problems of various natures that were identified by Brazilian educators and our observations had to be addressed: schools had been destroyed during the Indonesian invasion, and 80% of Timorese teachers did not speak Portuguese, one of the two official languages in East Timor. In addition, Brazilian educators were entering a post-war context with which they were unfamiliar.

As we began, we realized that there were at least two major challenges in coordinating the program: (1) the problems with Brazilian cooperative members related to stress from the isolation of the family, living in a country with a very different culture and different languages, with precariousness about didactic material, sanitary problems, and problems specific to a newly independent country, and (2) the challenges with Timorese teachers who did not have academic training and who spoke almost no Portuguese.

To address these challenges, Paulo Freire's (1968) book *Extension or Communication?* was essential for understanding our performance in this South–South international cooperation because it challenged us to think about the role of the coordinators working with Timorese teachers not as “extensionists” but as educators prepared for the practice of a liberating critique.

Freire positioned peasants as human subjects in the world, who are critical, dialogical communicators, responsible for the transformation of their realities. One of Freire's critiques of university extension projects is how they are implemented, often in a verticalized way, which can mean transmission, delivery, donation, messianism, mechanism, cultural invasion, manipulation, etc.

Usually, university “extension” programs imply doing external work, that is, actions with communities outside the university. The problem, however, is that we often see a

vertical relationship with those communities, where universities enter to illuminate a dark world, while also homogenizing cultural differences.

When, among our own group of Brazilian educators, we began to talk about solidary internationalism in higher education, we asked what kind of university internationalization would be effectively emancipative:

Thus, it becomes necessary and urgent to construct new understandings about international cooperation from institutions directly involved in the participating countries. In the case of Brazil, universities involved in South–South cooperation programs should discuss, and deepen their understanding of the differences, whether they are cultural, political, or economic, which we discussed here in terms of coloniality/subalternity emancipative processes. (Pereira, Linsingen and Cassiani 2015, p. 196)

We think that solidary internationalism must involve the struggle against the oppression of people who have been made subalternate. It requires empathy, listening, hope, patience, simplicity, love, dignity, and democracy. It requires struggles to uplift people as protagonists in their own stories of social transformation.

We learn from Freire (1968) that “It appears that the act of extension, in whatever sector it takes place, means that those carrying it out need to go to ‘another part of the world’ to ‘normalize it’ according to their way of viewing reality: to make it resemble their world” (p. 15). He defends the idea that when education is a practice of freedom, it is not to impose knowledge on “the ignorant” in order to save them (p. 15). Rather, it is to hear, perceive, and consider the knowledge of the people and engage them in the action of choosing, deciding, and transforming reality.

Thus, this dialogical approach to communication became increasingly influential for us, as reflected in the official document of the QTTPL program (2016), elaborated by several of the Brazilian educators.

Thus, we highlight that in the history of pedagogies that inspire the teachers of our cooperation, there is the example of the foundation based on the pedagogical praxis of Paulo Freire, evidenced in his *Pedagogy of the Oppressed*. (QTTPL 2016, p. 28) [...]

From his pedagogy, we learn that teaching is not transferring knowledge and also requires the awareness of the unfinished; recognition of being conditioned; respect for the autonomy of the being of the student; common sense; humility, tolerance, and struggle in defense of educators’ rights; the apprehension of reality; joy and hope; the conviction that change is possible; inquisitiveness. In Freirean thought, teaching is a human specificity that requires security, professional competence, and generosity; commitment; understanding that education is a form of intervention in the world; freedom and authority; conscious decision-making; knowing how to listen; recognition that education is ideological; willingness to dialogue and prioritizing student wellness. (QTTPL 2016, p. 28)

As stated, since the 1970s, even before the Indonesian invasion, there was already a Timorese guerrilla group working against Portugal. They were organized in the mountains to bring literacy to their companions. Inspired by Paulo Freire, they produced what they call Maubere Pedagogy.

According to the Timorese professors Gaspar Varela (2011) and Antero Benedito da Silva (2016), this praxis was the predominant educational mechanism for the Timorese resistance during the guerrilla period.

Silva (2011), in his PhD thesis on the *Revolutionary Front of Independent East Timor* (FRETILIN), is about popular education from 1974 to 1978. Silva (2011) emphasized that the word *obscurantism* appears many times in the Constitution of East Timor Democratic Republic (ETDR 1976). They proposed “undertaking an effective campaign against illiteracy and obscurantism and works to protect and develop (Timorese) culture as an essential instrument of liberation.” (Article 12, ETDR 1976, p. 34).

Anselmo Xavier (2016) tells us that the conditions were so hard that “during this time of resistance, the education model had literacy based on local knowledge and, as tools, charcoal and bamboo sticks or boards were used to write and read alphabets” (p.30).

This powerful speech gave FRETILIN the strength to face Indonesia until they achieved independence in 2002. In the next topic, we will talk about our learning with the actions in the QTTPPL program, starting in 2009.

Our decolonial turn in science education

After so many years of the struggle between Indonesian occupation and Timor-Leste independence, a new Timorese curriculum was implemented in 2011 by Portuguese cooperation. Unfortunately, it was developed with little participation of the Timorese teachers.

In this context, Timorese teachers told us of their difficulty in teaching with didactic material so distant from reality. Just to give an example, an exercise in a sixth-grade science textbook asked students to research three kinds of medicine: (1) conventional medicine, (2) traditional medicine based on evidence from experiences in daily life, and (3) traditional medicine, based on superstition, magic, and *obscurantism*. In the glossary of the science textbook, there is an explanation of what this word means: “obscurantism: state of those who live in darkness; in ignorance; the doctrine of those who oppose the development of education and progress because they consider them dangerous to social stability” (Cassiani 2018).

Traditional medicine was the target of attacks by Portuguese, Japanese, and Indonesian invaders, who considered traditional witch doctors like “human plagues” with their magical abilities. Examples like this can be considered emblematic for postcolonial Timorese society because the textbook referred to obscurantism of the Timorese traditional medicine. This ancestral knowledge guaranteed the survival of people who resisted in the mountains.

Martins and Henriques (2017, p. 104) teach us that the witch doctors used magic plants and those with natural medicinal properties. The prevalence of traditional witch doctors decreased over time. Barbosa and Paulino (2021) infer that there is a decrease in witch doctors in East Timor. This can be attributed, among other factors, to the onto-epistemological effects of coloniality, which led to the near disappearance of medicinal plant use and traditional medicinal knowledge in the Timorese territory:

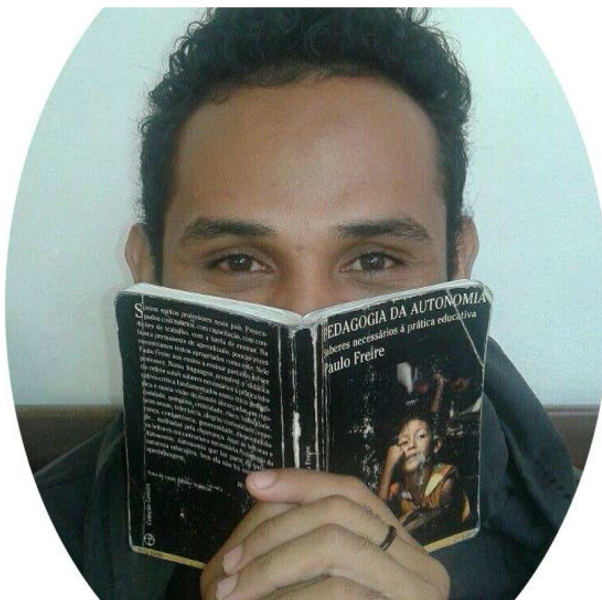
From this axis of coloniality, Timorese curators are reduced to sorcerers practicing witchcraft and deceiving people with charlatanism, not being recognized as their traditional millennial profession. Modern Western medicine is the only way to treat and cure diseases. Thus, we observe the formation of a binary category, modern vs primitive ancestors, which results in a dehumanization of the being, denial, and destruction of its collectivity. (pp. 19–20)

Decolonial studies and South epistemologies (Quijano 2010; Walsh 2017; Santos and Meneses 2010) helped us understand the ontological and epistemological effects of

coloniality that disrupt and silence the many forms of traditional knowledge and replace them with other colonizing constructs. This probably contributed to the loss of identity of the Timorese people, but not only in East Timor. The same effects of coloniality occurred in Brazil, rendering colonized subjects as inferior, rationalized, subordinated, and dehumanized, and causing low self-esteem, dependence, and a lack of belonging. These Eurocentric forms of epistemic violence were the supposed path of access to power.

However, while proposing a clear policy to combat obscurantism by promoting a mass literacy campaign, FRETILIN also, as the ETDR Constitution indicated, took into account the importance of indigenous or traditional popular knowledge. [...] FRETILIN education aimed to transform the Maubere People not just to develop a new man, which refers to a man (sic) of a new mentality, which is anti-colonial, anti-fascist, truly popular and democratic, but “a new man who takes an active part in politics to take part in the society that he belongs to.” Beyond literacy, therefore, the objective was to teach people about nationalism and the national liberation struggle, aiming to build a humane society. Thus, political education was integrated into the literacy campaign and the new education system (Nicol, 2002, p. 163) that laid the foundation of the recent struggle for the people’s liberation beyond the fight for a homeland. (Silva 2020, pp. 22–23)

Therefore, Freire is still very present in the imagination of the Timorese people. Thus, in our experience, speaking of Freire in East Timor with teachers and students of the university and schools, we encounter more empathy.



Source: own file. Cândia Freitas, a Timorese student of chemistry in 2012 at the National University of Timor Lorosa'e, holds the book *Pedagogy of Autonomy* by Paulo Freire in Dili, the capital of East Timor. He is currently a chemistry teacher at a Dili school.

We emphasize at least three ways to tell the “history of the present time” (Ferreira 2000) to understand the remains and ruptures of the past in the present:

- (a) critically reflecting on the past as a way to build other futures, i.e., stories that help us to read the world, and understand, (re)learn and act in the present;
- (b) seeking epistemological emancipation, bringing to light other epistemologies that have been silenced; and
- (c) proposing an anti-racist education through critical racial literacy, i.e., an education for action and against racism and other oppressions.

East Timor and Brazil had many similarities that fostered a brotherhood despite the distance, cultures, and territories, among many other differences. As we deepened this process, it was possible to understand that the various types of colonial effects are historical scars left both by the mercantilist political-economic system (colonialism) and by the epistemological approach of modern rationality (based on universality and neutrality), both European concepts that emerged inseparably in the fifteenth and sixteenth centuries (Cassiani and von Linsingen 2019).

Eduardo Galeano (2012, p. 324) translated this feeling in the text very effectively:

October 12 - Discovery Day

In 1492, the natives discovered that they were Indians, discovered that they lived in America, discovered that they were naked, discovered that they existed in sin, discovered that they owed obedience to a king and queen of another world and a god from another heaven, and that God invented guilt and clothes and that he ordered live burns, of all those who worshiped the sun, the moon, the earth, and the rain that wets it.

The process of invasion and colonization, especially from the sixteenth century, enabled some European countries to gain a privileged economic and political position. “Europe,” therefore, is a metaphor, everything that has been established as “a racial/ethnic/cultural expression of Europe, as an extension of it, that is, as a distinctive character of identity not subjected to the coloniality of power” (Quijano 2010, p. 86). According to Fanon (1961), Europe was filled too much with the gold and raw materials of colonial countries located in Latin America, Asia, and Africa. For him (p. 77), “the well-being and progress of Europe were built with the sweat and corpse of blacks, Arabs, Indians, and yellows; it is appropriate that we do not forget this.”

For 500 years, Portuguese colonialism was built from the trafficking of people kidnapped in its territories (Mozambique, Guinea Bissau, Sao Tome and Principe, Angola, and Cape Verde) and enslaved in the American continent, engendering violence of all forms and the systematic plundering of resources and knowledge from African, Brazilian and Asian colonies such as East Timor and Macau.

Cassiani (2021) pointed out that much of the poverty and racism in Brazil resulted from the kidnapping and enslavement of millions of people of the African continent during colonization. When slavery was abolished in Brazil in 1888, the colonial government did nothing to improve these conditions of poverty and racism. Currently, 56.2% of the Brazilian population is Black or brown; it is the country with the greatest proportion of Black people outside the African continent. Data from 2016 showed that 25.4% of the Brazilian population lived in poverty. Among those, 72.9% were Black or brown, demonstrating that structural racism is an ongoing oppressive condition from which

Black people still suffer. We do not have newer data because the current Brazilian President, Bolsonaro, is a political obscurantist who hides much of this type of information. We believe this number is much higher than what is currently being reported.

Even with the independence of the colonized countries, the legacy of coloniality remains. It operates through entrenched power relations and racial, cultural, territorial, gender, and epistemic hierarchies. The concept of coloniality helps us understand how certain human groups continue to be made subalternate and exploited, their knowledge and experiences ignored, since colonization. We encountered this in East Timor. Through our experience in East Timor, we realized that decolonial studies proved to be a fundamental theory for analyzing racial hierarchies and power differentials in science education.

Critical Whiteness studies involves white supremacist logic where, if you are white, you have more power and privilege in all aspects of society, but on the surface are considered equal to others because of the myth of racial democracy (Schucman 2014; Nascimento 2019), giving the appearance of equality despite underlying institutional and structural racism. Therefore, the anti-racist struggle is not only one for human rights and welfare. It is also a matter of stolen lands and historical debts, restating the dignity for indigenous people and Afro-Americans.

Grosfoguel (2016) tells us that religious racism was used by colonialism as an excuse for the theft of territories, i.e., that the indigenous peoples had no soul and needed to be catechized to be saved. This mode of religious discourse eventually shifted to scientific discourse, mainly due to Francis Galton, cousin of Charles Darwin, as eugenic studies argued that the original peoples did not have “good” genes. Eugenics arrived in Brazil at the end of the nineteenth century and contributed to structural racism in Brazilian society.

With a critical whiteness and decolonial perspective, we also began to understand how we could act in science education. Three elements were essential to understanding the functioning of whiteness: the denial of one’s racial position by coloniality of being; the universalization of white history; and the readings of stories, knowledge, and struggles of indigenous and African populations within the discourse of white supremacy (Orozco 2022).

We understand that it is not enough simply to make denunciations of science education about racism and sexism, and the silencing and belittling of Cimarron and indigenous peoples. For an emancipatory education, in line with Freirean dialectic denunciation-announcement, propositions must contribute to other forms of “seeing” and learning.

Living in an uncertain world in Brazil, where we have a robust social inequality, concerns about the COVID-19 pandemic have most greatly affected the poorest of the population, who could not be socially isolated due to high rates of unemployment and underemployment. They also do not have material resources such as drinking water and plumbing.

In the first decade of the twenty-first century, Brazil overcame hunger as a structural problem. A coup d’état in 2016 resulted in millions of people being hungry again. Furthermore, necropolitics characterized by violence related to racism, patriarchy, homophobia, and femicide have marked for us an extreme political regression. President Bolsonaro incentivizes the use of guns and violence against women, as well as indigenous, Black, gay, and trans people.

Based on this Brazilian chaos, our research group began to ask what we could do in science education to resist. What scientific citizenship were we talking about, and which one do we need to build? What science education topics were required to build another possible world?

Paulo Freire teaches us that citizenship is a constant struggle for people who have been subordinated. Freire considers that all citizens—and especially the marginalized subjects of society—provide a sense of collectivity and community, in which citizenship is built and manifested through their social relationships, without being limited to a sense of individuality. The educator, exercising citizenship as his ethical and political commitment, understands that the educational act is an act of freedom, one that exercises a fight for better living conditions, a fight for rights and dignity, or respect for his students, reflected in the experience and reality of the community in which it operates:

The worker needs to invent, from his own work, his citizenship that is not only built with his technical effectiveness but also with his political struggle in favor of the re-creation of unjust society, to cede his place to another less unfair and more humane. (Freire, 2001, p. 52)

We think that citizenship is not given or guaranteed either by scientific knowledge. Thus, we reaffirm science education as a transgressive space of struggle and freedom, where we can address social injustices:

We mobilize the maximum Freirean of dialogue, understanding of reality, awareness, and transformation with bell hooks. The struggles for gender equality, race, class, inclusion, and identity have strengthened us. From it, we learn how patriarchy and inter-intolerances relate to suppress the other and annihilate lives. In his speech, stigmas generated by capitalism are fought and denounced. (Sánchez, Accioly and Anjos 2021)

Therefore, science education needs to contribute to breaking the colonial silence. Among the work of Paulo Freire, we find an engaged pedagogy, which takes a stand and acts against oppression to build another possible world.

Our praxis: learning from East Timor

In 2009, we became QTTPL coordinators. We grounded our work in the Freirean dialectics of denunciation/announcement. We realized that for Brazilian educators working in a multilingual and plural context, it was not sufficient to simply have knowledge of the scientific or pedagogical content or to have teaching experience. One of the first actions we took was to try to understand the problems that we were experiencing.

Pereira (2014), in her research on the QTTPL program, interviewed Brazilian educators (BE) who worked in East Timor. They help us to understand many problems about the writing of textbooks, the need for autonomy of the Timorese teachers, the dialogicity of knowing, among others:

(...) I think Timor must create their history. I find it very complicated because I have already witnessed some situations of imposition there, so it has nothing to do with it, we are colonizing again. It is colonizing a free people indeed. So I saw many hands trying to make this curriculum and the Timorese having very little participation. In the *sebentas* we tried a lot, see? We were 4 of us trying to get Timorese teachers to work together on the scrapbooks. We couldn't. So they ended up there, not in Biology, because I remember that we were extremely careful about it, leaving greasy talking about Copacabana beach (...) I think that, in fact [other

countries work in Timor] it is another way of colonizing, because you get there, the foreigner gets there and says: “the curriculum will be like this, the teaching program will be like this.” I think it’s an important thing, they need it, they do need it, but in a collaborative way. (BE 1, Pereira, 2014, p. 150)

One thing that cooperation still needs to contemplate is the autonomy of the Timorese teacher in the elaboration of didactic material. Do not burn all the books there, but think of materials that they themselves can produce and must produce to be able to complement what is there because it is also not all bad. These changes can be made, I believe, in the process. (BE 2, Pereira 2014 p. 152)

Because we were also colonized and therefore subalternized, an understanding of the effects of coloniality in its multiple forms became evident. This is exemplified in the speech of a Brazilian educator: *We are heirs of Paulo Freire*.

We learned the history of the Timorese resistance and the struggle for independence and came to understand the glaring injustices of the cultural invasion in East Timor. We could see its consequences: a loss of self-esteem, consumerism, loss of local identity, devaluation of culture itself, devaluation of ancestral customs and knowledge (epistemic violence), lack of belonging, and economic dependence. Specifically, in education, we could see the transnationalization of the curriculum (Cassiani 2018; Dale 2004) by foreign projects. These curriculum shifts occurred without the participation of Timorese teachers, indicative of an ongoing coloniality of knowledge and power. These were a few problems we observed, among many others.

Then, at that moment, we began a process of decolonizing our hearts and minds, as well as curriculum knowledge, and education itself, trying to highlight the oppression of peoples of the South; recognizing and legitimizing our ways of being, thinking, and living; and promoting mutual South-to-South transformations.

We had two fronts of action regarding the idea of solidary internationalism. One investigated the best profile of Brazilian educators’ members to work in this context of tangible colonial heritage, in a post-war multilingual and multicultural society.

In this way, we needed to understand how our work could meaningfully contribute to Timorese teacher education and to science education that was dialogical, horizontal, critical, emerging from Timorese interests.

We drew from works that helped us in our approaches to teacher education in Brazil, such as southern epistemologies and decolonial studies, to understand the effects of the coloniality power/knowledge/being/living in East Timor (Cassiani, Pereira and Linsingen 2014).

But what about science teaching? According to Grosfoguel (2008), when he speaks of geopolitics of knowledge, within the scope of scientific research, he notes: men studied women, considering them research objects; white subjects examined non-white ones as objects of knowledge, assuming that they themselves were neutral observers, not situated in any space or body; there was no room for research of and *with* ethnic-racial groups, but only *on* these; research conducted by women and Black scientists was silenced through a mechanism of exclusion by patriarchy; and scientific studies on gender and sexuality were marginalized.

What scientific topics do our students/teachers need to learn in East Timor, we asked ourselves, and what other historical, artistic, and philosophical knowledge should be included in this curriculum? Would we have the wisdom to teach science and knowledge endowed with critical thinking grounded in Timorese social realities?

These experiences, studies, and investigations have provided us with different questions. We articulate two of the most relevant for our reflections in this article: What elements are essential to a South–South social justice-based teacher education program? How can we propose a counter-hegemonic science education that moves away from a contemplative posture facing the problems?

Some guiding principles helped us to consider the continued preparation of the Brazilian educators:

- Understand that there are differences between peoples and that we should not seek to replace one knowledge system with another.
- Know that knowledge is a process.
- Understand that if in the same language there are polysemic meanings, in a country like East Timor where people speak about 32 natives languages, the communication could be more complicated.
- Work from a desire to learn from the other.
- Be supportive and know that it is always necessary to observe your limits.
- Be mindful of uncertainties in a post-conflict country.
- Prioritize dialogical learning.
- Listen more than predict. Have respect for all.
- Prepare all teachers to adopt an intercultural approach not only in multilingual, multicultural societies but in all spaces of school and life.
- Work **with** and not **for** Timor: facilitate **collective work** for emancipation.

Our actions, ideas, and propositions developed with the Brazilian educators were fundamental for the proper functioning of the program. We researched the Timorese social reality and worked to co-construct knowledge for the program. Of the actions related to the internal functioning of the QTTPL program, we highlight the following:

- the choice of Brazilian educators engaged in several areas of research in education (psychology, nature sciences, sociology, philosophy, pedagogy) with experience in higher education;
- a week preparatory course in Brasília, Brazil, with information about East Timor to Brazilian educators—culture, language, education, difficulties, history, money, how to live over there, etc.— And to continue this process was held one week for immersion in Timorese territory for adaptation and planning of the actions to be developed;
- learning the Tetum language, as it was often the only means of communication with the Timorese;
- several alternatives for the education of Brazilian educators: weekly meetings for studies of texts and discussions with deepening of local themes; creation of research groups; external specialists, foreign and Timorese, who discussed issues related to problems that emerged;
- diagnostic and formative practice by all Brazilian educators for constant evaluation of the work in East Timor; the constant presence of coordinators in the country (face to face or online); and
- the construction of the memory of QTTPL, by means of the site in which we present the projects, reports, official documents, articles, books, interviews, photos, and records of meetings organized by Brazilian educators in different spaces of formal and non-formal education, including the university. National Timor Lorosa'e—<https://pqjp.ufsc.br/>

We should emphasize that with regard to our reports constructed with Brazilian educators in East Timor, it was a “dialogical evaluation practice, between pairs, horizontal, allowing greater clarity about the positive processes and results and what needs to be reformulated, rethought” (QTTPL 2016, p. 58). The evaluation of the process helped to avoid the recurrence of mistakes, such as the lack of dialogue between Brazilian and Timorese educators. Taking the right decisions contributed to resolving the difficulties:

From this evaluation model, the results obtained should always be shared with everyone to contribute to identifying the difficulties and possibilities, thus strengthening the program. Therefore, the evaluation is an organizing strategy of multiple views and actions on the reality of East Timor, intending to get closer to the teamwork of excellence. (Ibid., p. 58)

Therefore, constructing a profile of Brazilian educators consistent with local demands brought us an incredible improvement in the development of collective work, with security, respect, critical, respect, shared interest, affection, and solidarity.

Thus, we can synthesize here some aspects needed for Brazilian educators to work in East Timor:

- dialogue and greater integration, cooperative spirit;
- ability to adapt to the new culture Otherness—autonomy is built;
- flexibility, humility, common sense, disposition, research;
- total respect for cultural differences;
- detachment;
- sensitivity;
- learning and unlearning;
- living the uncertainties;
- being able to redo and resume actions that don’t seem to happen as expected;
- knowing how to deal with our own mistakes and misconceptions;
- knowing how to see beyond what you expect. (Pereira and Cassiani 2021 p. 320)

What is a problem?

In this article, because of space constraints, we could not talk about everything we had taught or learned in East Timor. Just as an example, what follows is a didactic-pedagogical proposal from the perspective of dialogical education in the physics teaching discipline of the QTTPL for teachers of pre-secondary and general secondary schools. The proposal was elaborated and **developed with** Timorese teachers, inspired by Paulo Freire with the STS approach (Cassiani and Linsingen 2013, Lunardi 2013). The objective was to value the Timorese culture and identity and deepen scientific and ancestral knowledge.

We begin with a dialogue about the importance of working at school with everyday issues experienced by the community. To start the discussions with the teachers in training, we problematize with the following questions: What is meant by science and technology? What issues are relevant to your community and to Timor Leste? How to work with a perspective in which human beings also take part as an “environment”? How to engage in a discussion in a problematizing way? Or what is a problem? In this debate,

we sought to list topics related to the problem-situations of the community where the Timorese teachers were inserted. We organized the work in stages: preliminary survey and profile of Timorese teachers; analysis of situations and choice of a theme; deepening dialogues; thematic investigations; thematic reduction (Delizoicov 2008).

The theme chosen by the group was the tais, a fabric that is a symbol of the country, recently declared an Intangible Cultural Heritage in Need of Urgent Safeguarding by the United Nations Educational, Scientific and Cultural Organization (UNESCO). In this photo, we can see a young woman making a tais in her loom.



Source: own file.

To begin, we request the writing of a text in its various social, cultural, historical, economic, and scientific aspects, with the following questions: Where does tais come from? What is the production path of tais? How important is tais in the community you live in?

Later, we divided into groups to draw up a scheme on the path of tais, so that all the teachers in training could jointly build and discuss the scheme drawn up on the board.

We were delighted with the countless possibilities raised by the Timorese teachers. From the production of the written text and its discussion, the teachers raised different perspectives on tais, which brought excellent ideas to work from the local reality, such as photosynthesis in cotton production, weaving from different ethnicities, the ancestral knowledge of family agricultural production, the technology of the loom, the role of women, the ancestral knowledge in dyeing the fabric, boiling to extract the colors of leaves, fruits, roots, stems, mud to fix the colors, etc., the production of different colors and dyes, their different uses in sacred rituals (death, marriage, birth), the pride of the nation, the importance of culture in education, marketing and selling to Malais (foreigners), production with Chinese yarn and artificial inks. Anyway, it was an explosion of meanings and mutual learning.

In the thematic investigation phase, which involved the deepening of this discussion in groups, we related science with ancestral knowledge, in a dialogue of knowledge.

After this discussion, we Brazilian educators and Timorese teachers planned how to investigate the issue beyond the school. We thought about who would be important to

interview and asked questions about what we would like to delve deeper into, in field trips. The places chosen were Ataúro Island, the tais market and in the communities where the teachers lived. It was agreed that the interviews would be carried out with the following people: weavers, merchants, buyers, elders, and other teachers from the schools of origin.

In the thematic reduction stage, Lunardi (2013) articulated the possibility of a significant theme related to the valorization of local culture and family farming in the production process of tais, which could give rise to the following themes: the energy in the production of tais, the colors of tais, the instruments for making the tais.

Based on this articulation of knowledge, the Timorese teachers prepared lesson plans in accordance with official documents.

For Lunardi (2013), this proposal had potential in the education of critical teachers and for the conscious analysis of social, historical, and political events that happen in their surroundings or extrapolate this dimension. The possibility of critical teachers working in the classroom, from the perspective of liberating practice, allowed for the observation and reflection of the sociocultural differences in their daily lives.

So this kind of praxis gave us a rethinking of science and science education in post-conflict societies, and also relations between natural and human sciences in educational practices; fieldwork as a method of teaching and scientific research; relationships between scientific knowledge and traditional knowledge; social technology—concepts and possibilities of use in Timor; the idea of nature in Timorese culture; an understanding of the effects of coloniality on knowledge/power/being/living; co-teaching to overcome language boundaries; linguistic policy; the possibilities of South–South cooperation with a horizontalized vision, the transnationalization of education in Brazil; the education of intercultural teachers; and the rescuing of silenced ancestral knowledge/well living. Themes for fighting social inequalities include education for ethnic-racial relations, gender and sexuality studies, epistemic racism, and decolonial practices in science education (Pereira 2014; Cassiani and von Linsingen 2019).

To end this topic, we bring some critical words of a Timorese teacher:

Based on the methodology [approached by the Brazilian professors], our work has a difference because it explains, exemplifies something that exists in reality. Before, the examples were only written. [...] we can relate to the reality that we had. So much so that, before, I thought, “where are we going to get this object?” And this object could be closer to us. Before, people talked on a cell phone and didn’t see the cell phone [in East Timor]. Another thing, for example, before, it said “we can keep the food in the fridge,” but before I didn’t see the fridge, I didn’t have it in Timor. Now, we can show them [the students] the fridge, not just paint it on the board, but I can take a picture and show it in the room. (Pereira, 2014)

This was very common in East Timor because science textbooks were not written by Timorese teachers. Unfortunately, it was and still is possible to find many examples far from everyday life. In a country where 85% live with organic subsistence agriculture, there is information on mechanization of agricultural practices, automatic pesticide spraying systems, soil treatment with tractors (Barbosa, 2018, 224).

It is also possible to find this in science book drawings of laboratories with many test tubes to teach chemistry concepts such as condensation. That is, it is not considered that one of the most popular alcoholic beverages is used in rituals. It would be used as a popular condenser with fire and bamboo (Cassiani, 2018).

In another investigation, Venancio Sarmiento (2016) interviewed teachers about a new curriculum implemented by the Portuguese Cooperation. He analyzed the absence of contextualization of biology issues in relation to the realities of Timor:

In general, I can say that the current curriculum appropriate, but not yet well suited to our situation in Timor. For example, the material that explains the environment geography, lagoon, mountains, etc., refers to one place. In my opinion, this curriculum is good for us Timorese. But we can't forget, for example, that maybe there is some content that is in the biology curriculum, only in general, there are no specific details. This goes make it difficult for our Biology teachers. Per this, our teachers still need to look for some extra information to complete the article and that through the Malay language (Indonesian) in order to of solving this problem. (Teacher, 3, Sarmiento 2016, p. 65)

Sarmiento (2016) pointed out that Timorese teachers identify limitations in the materials produced. In his interviews, as in the highlighted passage, they indicated the need to complement the contents of the manuals to present topics closer to the reality of East Timor.

Relearning Latin America

For us Latin American Brazilians living in a country with strong social inequality, unfortunately, these are uncertain times. We are reeling from the consequences of the COVID-19 pandemic and the ongoing scientific denialism of anti-vaxxers that directly affects public health efforts. Of course, the COVID-19 pandemic exacerbated urgent problems that already existed, such as increased hunger and various forms of violence related to racism, patriarchy, and homophobia, all couched within a regressive necropolitics. Paulo Freire teaches us that citizenship is a constant struggle for people who have been subalternate. Moreover, citizenship is not only guaranteed by scientific knowledge.

So, our investigation group tried to answer which scientific citizenship we are talking about. Which citizenship do we need to build? What are the essential elements and methods for a science education in which the goal is to achieve another possible world?

There is much to think about. What perspectives and ways of being does research in science education silence? What could a decolonial *science* be for the Global South? What is dialogical knowledge for science education? How can we facilitate a dialogue between scientific knowledge and other epistemologies?

To answer whether it was possible to teach content such as that of the eukaryotic cell from a decolonial anti-racist perspective, Orozco (2022) carried out an intervention with 50 students in the sixth grade of a Colombian institution through the research of the Senegalese scientist Cheikh Anta Diop (1923–1986). The students began interrogating systemic racism in textbooks, exploring assumptions about what skin color the inhabitants of ancient Egypt had, and what kinds of evidence would support these ideas.

In the first stages, Orozco problematized and analyzed with his students the images of scientists in textbooks from which questions about gender, skin color, and scientific activity developed. Then he had students read fragments of the work of the African scientist Cheikh Anta Diop, who studied the eukaryotic cells in the skins of mummies from Egypt. At another time, students observed the eukaryotic cell and the production of melanocytes that gives the skin coloring. The students also noticed how Black people in Egypt were portrayed as white people in Hollywood movies. In another activity, it was proposed to

students to imagine traveling to the past to meet with Cheikh Anta Diop. The students wrote a letter to help him in his research and struggle.

To end the work, Orozco discussed the results about scientific production and structural racism with his students, their parents, and Black scientists.

It was possible to observe that the experience contributed to learning scientific concepts about cellular structure and physiology along with political development such as understanding racism as a determining factor in social inequality. Both families and students were interested in and supported the learning. However, this openness does not imply that various problematic positions and discriminatory manifestations were not expressed during the process. It is essential to understand that the questioning of whiteness generates resistance because it means observing one's privileges; decoloniality represents, above all, a long-term process. This experience is considered the first of many steps to take and to re-think through pedagogical and didactic praxis. (Orozco 2022, p. 214)

Decolonial studies are necessary lenses through which to look at science education (Monteiro, Dutra, Cassiani, Sánchez, and Oliveira 2019; Cassiani and von Linsingen 2019). Decolonial studies are another way of understanding the world, as well as thinking about the contributions to the transformation of human beings, perhaps also by the university and society. Thus, science education can have an activist function. By contributing to the debunking of historical myths, it also contributes to the anti-racist struggle.

In addition to these issues, we would like to note that decoloniality in education and scientific research is under construction. Thus, decoloniality must be constructed, lived, criticized, practiced, experienced, and systematized to reflect what this decolonial praxis can become. Nevertheless, we can hope that our critical provocations can contribute to decolonial pathways for the field. We hope that the initial inspirations and contributions from our work can nourish and strengthen a movement for decolonial science education more broadly.

Thank you, our dear Professor Paulo Reglus Neves Freire

At the end of the program, in 2016, according to the report (QTTPL 2016), about 10,000 Timorese people had developed some educational activities with us. These interactions provided us with experiences of collective education in Timor-Leste that were only possible due to the pedagogy of the question developed by Paulo Freire.

Over the years, the Brazilian cooperation opened a path, a kind of “decolonial trench,” that enabled dialogue as well as listening to those not heard for a long time. Through this dialogical movement, we were able to deconstruct some oppressive policies that were for a long time perpetuated in education in general, as well as in the training of teachers, especially through transnational histories. We conclude that intercultural and decolonial pedagogical approaches to our work was only possible because of the pedagogy of the question and the Freirean dialogicity awakened new dreams (Cassiani and Pereira 2021).

As we have already stated, our decolonial and anti-racist approaches adopted in our research group have proved valuable and meaningful as we articulate across and between different fields of disciplinary knowledge.

After the end of the QTTPL in 2016, we continued to develop others academic mobility projects, exchanging between Timorese and Brazilian students and professors from UFSC and UNTL. For example, the project “Repository of intercultural practices: Propositions for decolonial pedagogy,” for which the objective is to find ways to oppose the effects of coloniality, intends to propose a dialogical knowledge, favoring emancipation and the non-creation of dependence or subalternation and a culture of peace (<https://repi.ufsc.br/>).

Several research works were developed by Timorese students who came to study in Brazil. Others were carried out by Brazilian educators from the QTTPL program, mainly based on topics involving education and languages, such as interculturality and decoloniality (Pereira, 2014) and Coteaching (Janning 2016), Barbosa (2018), Xavier (2016) Sarmiento (2016) among other investigations.

Janning (2016) investigated co-teaching between Brazilian and Timorese teachers in a single classroom at the same time. In a situation of interview, the teachers approached a series of problems that made the practice of co-teaching difficult. One of them was the difficulty with the Portuguese language:

In my first class with the Portuguese teacher it was very difficult, it was very difficult for me, right? The classes were in Portuguese, all the classes were in Portuguese so... I couldn't explain it in Portuguese, and it was difficult for me and the students were also having difficulty. And over the course of a year I learned, I learned and after a year I was able to understand, the Portuguese language has improved a little. So after a year I worked more with is... a Brazilian teacher and I was already a little confident in communicating in Portuguese. And then the classes work, right? If it was the students, the students do not understand these contents, I would explain them in Tetum so that the students could understand these contents. (Teacher Paulo) (Janning 2016, p. 129)

We believe that international cooperation is vital to East Timor and Brazil. It was fundamental to understanding the solidary internationalism among the Global South. We learned so much. One factor that draws our attention is the relatively large amount of research carried out on the issue of East Timor in Brazil. According to a website compiling the theses and dissertations from a digital library of the federal government, we have 138 studies (97 dissertations and 41 PhD theses), starting in 2005, when cooperation began between the two countries.

These numbers can reveal how much the two countries have learned in a dialogue of knowledge, a fundamental aspect of South–South cooperation and solidary internationalism between our countries.

Therefore, it is fundamental to understanding solidary internationalism among the Global South from the perspective of Freirean dialogical concepts of denunciation and announcement. Looking at cooperation from a Freirean perspective, we know that education needs to provide opportunities for subjects from both countries to share ideas, anxieties, doubts, knowledge, and learning, to build a world with more love and solidarity.

Hence, in honor of the 100 years of our dear Paulo Freire, who gives us strength to hope, we end with a poem by Celso Sanchez:

Save, save, Fellow Paulo

I saw in your eyes, horizons and
 Heading for that glow
 Where untested feasibilities are born
 And they fly like rainbow colors

I saw in your hands of first words
 The gesture and choreography of affection
 I've seen in your footsteps around the world
 The taste and flavor of this Earth
 I saw in your lessons the indignation
 And your desire for justice and inventions
 The beautiful (bonitezas) and love
 In the assurance of our walk
 Maybe that's why my friend Paulo
 What is so afraid of those who want to deny
 They're so scared of our dreams
 And our indelible hope (esperançar).
 Thank you, Fellow Paulo

References

- Barbosa, A. (2018). (De)Colonialidade No Currículo De Biologia Do Ensino Secundário Geral Em Timor-Leste. Federal University of Santa Catarina. Tese de Doutorado. <https://repositorio.ufsc.br/bitstream/handle/123456789/206059/PECT0379-T.pdf?sequence=-1&isAllowed=>
- Barbosa, A., & Paulino, V. (2021). O pensamento decolonial antropofágico na educação em ciências. *Revista Perspectiva*. <https://doi.org/10.5007/2175-795X.2021.e66432>
- Betto, F. (1996). A experiência pedagógica do exílio (Frei Betto e Paulo Freire). In M. Gadotti (Ed.), *Paulo Freire: uma biobibliografia*. Acervo Paulo Freire. https://edisciplinas.usp.br/pluginfile.php/4144514/mod_resource/content/1/FPF_PTPF_12_069.pdf
- Bianchetti, V., Linsingen, I., & Cassiani, S. (2019). Formação cidadã na educação científica e tecnológica: olhares críticos e decoloniais para as abordagens CTS. *Educação & Fronteiras*. <https://doi.org/10.30612/eduf.v9i25.11012>
- Cassiani, S. (2018). Reflexões sobre os efeitos da transnacionalização de currículos e da colonialidade do saber/poder em cooperações internacionais: foco na educação em ciências. *Revista Ciência e Educação*. <https://doi.org/10.1590/1516-731320180010015>
- Cassiani, S. (2021). Counter-hegemonic science education: Understanding the effects of coloniality and proposing a decolonial pedagogy. *Cultural Studies of Science Education*, 16, 1353–1360. <https://doi.org/10.1007/s11422-021-10043-x>
- Cassiani, S., & Linsingen, I. (2009). Formação inicial de professores de Ciências: Perspectiva discursiva na educação CTS. *Educar em Revista*, 25(34), 127–147. <https://doi.org/10.1590/S0104-40602009000200008>
- Cassiani, S., & von Linsingen, I. (Eds.). (2019). *Resistir, (Re)Existir E (Re)Inventar a Educação Científica e Tecnológica*. Núcleo de Publicações do Centro de Ciências da Educação. https://nup.ced.ufsc.br/files/2019/08/Ebook-PPGECT_Suzani-com-401-p%C3%A1ginas.pdf
- Cassiani, S., Pereira, P., & Linsingen, I. (2016). (Pre)textos para pensar a cooperação educacional em East Timor: algumas referências para o internacionalismo solidário. *Revista Perspectiva*, 34(2), 390–414. <https://doi.org/10.5007/2175-795X.2016v34n2p390>
- Cassiani, S., & Pereira, P. B. (2021). Dialogicidade freireana: um contraponto na formação docente intercultural. *Revista Ensino, Saúde e Ambiente*, 14, 301–331. <https://doi.org/10.22409/resa2021.v14iesp.a51087>
- Castro, G., & Grosfoguel, R. (Eds.). (2007). *El Giro Decolonial: Reflexiones para una diversidad epistémica más allá del capitalismo global* (pp. 93–126). Bogotá: Pontificia Universidad Javeriana/Siglo del Hombre, Editores.
- Collins, P. H. (2019). *Pensamento feminista negro: conhecimento, consciência e a política do empoderamento*. Boitempo Editorial.
- Dale, R. (2004). Globalização e Educação: Demonstrando a Existência de uma “Cultura Educacional Mundial Comum” ou Localizando uma “Agenda Globalmente Estruturada para a Educação?” *Educação e Sociedade*, 25(87), 423–460. <https://doi.org/10.1590/S0101-73302004000200007>

- Delizoicov, D. (2008). La Educación en Ciencias y la Perspectiva de Paulo Freire. *ALEXANDRIA Revista de Educação em Ciência e Tecnologia*, 1(2), 37–62. <https://periodicos.ufsc.br/index.php/alexandria/article/view/37486>
- East Timor Democratic Republic. (1976). *Constitution of East Timor Democratic Republic*. Díli. http://timor-leste.gov.tl/wp-content/uploads/2010/03/Constitution_RDTL_ENG.pdf
- Fanon F. (1961). *Condenados da Terra*. Editora ULISSEIA.
- Ferreira, Marieta de Moraes. (2000). História do tempo presente: desafios. *Cultura Vozes, Petrópolis*, 94(3), 111–124.
- Fleuri, R. M. (2004). *Intercultura y Educación*. Astrolabio, 1. <https://revistas.unc.edu.ar/index.php/astrolabio/article/view/155>
- Freire, P. (1967). *Educação como Prática de Liberdade*. Paz e Terra.
- Freire, P. (1968). *Extensão ou comunicação?* Paz e Terra.
- Freire, P. (1970). *Pedagogia do Oprimido*. Paz e Terra.
- Freire, P. (1978). *Cartas à Guiné Bissau*. Paz e Terra.
- Galeano, E. (2012). *Os filhos dos dias (Um calendário histórico sobre a humanidade)*. L&PM Editores.
- Grosfoguel, R. (2008). Para descolonizar os estudos de economia política e os estudos pós-coloniais: Transmodernidade, pensamento de fronteira e colonialidade global. *Revista Crítica de Ciências Sociais*, 80, 115–147. <https://doi.org/10.4000/rccs.697>
- Grosfoguel, R. (2016). A estrutura do conhecimento nas universidades ocidentalizadas: Racismo/sexismo epistêmico e os quatro genocídios/epistemicídios do longo século XVI. *Revista Sociedade e Estado*, 31(1), 25–49. <https://doi.org/10.1590/S0102-69922016000100003>
- Janning, D. (2016). *A Codocência Em Ciências Da Natureza Na Universidade Nacional Timor Lorosa'e: Reflexões Sobre Colonialidades Na Formação De Professores*. Master in Scientific and Technologic Education, Federal University of Santa Catarina. <https://repositorio.ufsc.br/bitstream/handle/123456789/168077/339961.pdf?sequence=1&isAllowed=y>
- Lunardi, G. (2013). *Uma Experiência Na Formação De Professores Em Timor-Leste: Das Condições De Produção Aos Sentidos Construídos No Enfoque CTS*. Master in Scientific and Technologic Education, Federal University of Santa Catarina. <https://repositorio.ufsc.br/bitstream/handle/123456789/129324/328481.pdf?sequence=1>
- Martins, X., & Henriques, P. D. S. (2017). Contribuição para o estudo do valor socioeconômico e cultura das plantas medicinais de Timor-Leste. *Revista Veritas*, 5(1), 101–125. <https://dspace.uevora.pt/rdpc/bitstream/10174/20271/1/Contribui%C3%A7%C3%A3o%20para%20o%20Estudo%20do%20Valor%20Socioecon%C3%B3mico%20e%20Cultural%20das%20Plantas%20Medicinais%20de%20Timor1008.pdf>
- Memmi, A. (1977). *Retrato do Colonizado Precedido do Retrato do Colonizador*. Paz e Terra.
- Monteiro, B., Dutra, D., Cassiani, S., Sánchez, C., & Oliveira, R. D. V. (Eds.). (2019). *Decolonialidades na educação em ciências*. Livraria da Física.
- Orlandi, E. (2005) *Análise de Discurso: Princípios e Procedimentos*. Ed. Pontes.
- Orozco, Y. (2022). *Antirracismo e Dissidência Sexual e de Gênero na Educação em Biologia: Caminhos para uma Didática Decolonial e Interseccional*. Universidade Federal de Santa Catarina. Tese de Doutorado. <https://repositorio.ufsc.br/handle/123456789/234724>
- Pereira, P. B. (2014). *O Programa de Qualificação de Docentes e Ensino de Língua Portuguesa no East Timor (PQLP): um olhar para o ensino de ciências naturais*. Universidade Federal de Santa Catarina. Tese de Doutorado. <https://repositorio.ufsc.br/handle/123456789/132956>
- Pereira, P. B., Linsingen, I., & Cassiani, S. (2015). International educational cooperation, coloniality and emancipation: the Program Teacher Qualification and Portuguese Language Teaching in East Timor and the teacher education. *Revista Brasileira de Pós-Graduação*, 12(27), 193–218. <https://rbpg.capes.gov.br/index.php/rbpg/article/view/499/pdf>
- Portugal. (1960). *Livro de Leitura para a 4ª classe*. Série escolar Educação. Editora Educação Nacional.
- Qualification of Teachers and Teaching of the Portuguese Language. (2016). *Programa de Qualificação de Docentes e Ensino de Língua Portuguesa. Projeto Político Pedagógico*. Universidade Federal de Santa Catarina. <https://pqlp.ufsc.br/wp-content/uploads/2015/05/Projeto-Pol%C3%ADtico-Pedag%C3%B3gico-PQLP.pdf>
- Quijano, A. (2010). Colonialidade do Poder e Classificação Social. In B. S. Santos, M. & P. Meneses (Eds.), *Epistemologias do Sul*. Almedina.
- Sánchez, C. Accioly, I., & Anjos, M. B. (2021). Carta das organizadoras e dos organizadores do dossiê “Paulo Freire para além dos 100 anos: construir utopias, transformar a realidade” – quando encontramos bell hooks ... *Revista Ensino, Saúde e Ambiente*, 14 (special number). <https://doi.org/10.22409/resa2021.v14iesp>
- Santos, B. S., & Meneses, M. P. (Eds.). (2010). *Epistemologias do Sul*. Almedina.

- Sarmiento, V. (2016). *O Currículo De Biologia Em Timor-Leste: Um Estudo De Caso Na Escola 12 De Novembro - Becora, Dili*. Master in Scientific and Technologic Education, Federal University of Santa Catarina. <https://repi.ufsc.br/sites/default/files/339492.pdf>
- Schucman, L. V. (2014). *Entre o encardido, o branco e o branquíssimo. Branquitude, hierarquia e poder na cidade de São Paulo*. Annablume.
- Silva, A. B. (2011). *FRETILIN Popular Education 1973–1978 and its relevance to Timor-Leste today*. University of New England.
- Silva, A. B. (2016). Educação Timoriana: uma proposta alternativa. In V. Paulino, & A. T. Barbosa (Eds.), *Língua, Ciência e Formação de Professores em East Timor*. Ed. Universidade Nacional de Timor-Lorosa'e.
- Silva, A. B. (2020) Literacy model of the Maubere pedagogy. In S. Urban, A. Silva, & I. Linsingen (Eds.), *Popular education in East Timor: past and present experiences*. Mossoró: Ed. Universidade do Estado do Rio Grande do Norte.
- Sousa, D. (2007). *Colibere: Um herói timorense...* Lidel.
- Urban, S., Silva, A., & Linsingen, I. (Eds.). (2020). *Popular education in East Timor: past and present experiences*. Ed. Universidade Estadual do Rio Grande do Norte. https://www.uern.br/controldepaginas/edicoes-uern-ebooks-2020/arquivos/5737popular_education_in_timor_leste_past_and_present_experiences_final.pdf
- Varela, G. (2011). *Uma abordagem histórico-crítica da formação de professores de matemática no Timor Leste: diagnóstico e proposição* [Unpublished master's thesis]. Universidade Federal de Goiás.
- Walsh, C. (2017). Interculturalidad Crítica Y Pedagogía De-Colonial: Apuestas (Des)De El In-Surgir, Re-Existir Y Re-Vivir. In *Pedagogías decoloniales: Prácticas insurgentes de resistir, (re)existir y (re)vivir*. TOMO II, Ediciones Abya-Yala.
- Xavier, A. (2016). *Formação Professores Da Biologia Em Língua Portuguesa No Timor-Leste Refletindo As Dificuldades Acerca Do Processo Ensino -Aprendizagem*. Master in Scientific and Technologic Education, Federal University of Santa Catarina. <https://repositorio.ufsc.br/xmlui/bitstream/handle/123456789/168284/339496.pdf?sequence=1&isAllowed=y>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.

Suzani Cassiani is professor of the Graduate Program in Scientific and Technological Education at the Federal University of Santa Catarina.

Irlan von Linsingen is professor of the Graduate Program in Scientific and Technological Education at the Federal University of Santa Catarina.