


BRAZILIAN SEMI-ARID REGION. A TERRITORY OF THREE BIOMES <https://doi.org/10.56238/sevened2025.001-045>

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ABSTRACT

The Brazilian Semi-arid is a complex region, not only in terms of climate, but also in terms of geography, history, vegetation and socioeconomic aspects. Initially delimited in 1936 as the "Polygon of Droughts", the region was predominantly associated with the Brazilian Northeast, but over time, its understanding and delimitation have been expanded and refined. This study aimed to analyze the contribution of the three main Brazilian biomes - Caatinga, Cerrado and Atlantic Forest - in the composition of the Brazilian Semiarid. Using data from the Brazilian Institute of Geography and Statistics (IBGE), the research mapped the presence of these biomes and their transitions in the semi-arid region. The results revealed that the Caatinga is the predominant biome in the region, present in about 78% of the municipalities and covering more than 75% of the total area of the Semi-arid region. However, there was a significant increase in the presence of the Cerrado Complex and the Atlantic Forest Biome, indicating environmental diversification in the region. These findings have important implications for public policy planning, suggesting the need for more localized approaches adapted to the specific characteristics of each area to promote the sustainable development and resilience of semi-arid communities.

Keywords: Semi-aridity. Caatinga. Atlantic Forest. Cerrado. Planning.

INTRODUCTION

The term Semi-arid can have several interpretations. In Brazil, it is usually associated, first, with a region and then with a climate. Although it is predominantly a climate. As a region, the first attempts at delimitation arose when the publication of Federal Law No. 175, of January 7, 1936 (BRASIL, 1936), which established the territorial bases for what would later be called the Brazilian Semi-Arid - SAB or Semi-Arid Region - RSA, from the delimitation of the Polygon of Droughts, at the time, formed by part of the states of Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe and Bahia. The term Polygon of Droughts referred to the Region from 1936 to 1988 when, for constitutional purposes (BRASIL, 1988), it came to be called "... Northeast Region, preferably in the Semi-arid Region" (Article 42, Item II) and "... to the semi-arid Northeast..." (Article 159, Subsection I, letter c). It should be noted that there was still no understanding that the Semi-arid was not only in the Northeast, since Federal Decree-Law No. 8,486, of December 28, 1945 (BRASIL, 1945) inserted municipalities in Minas Gerais, and consensus as to the spelling to be used.

After undergoing several modifications in terms of area and number of municipalities without scientific criteria, it was from 1989 onwards that the insertion of the average rainfall of the last 30 years equivalent to ≤ 800.0 mm was established as a criterion for the insertion of municipalities in the Region (SUDENE, 2021). Subsequently, in 2005, the criteria of Average Precipitation ≤ 800.0 mm, Aridity Index ≤ 0.50 and Daily Percentage of Water Deficit $\geq 60\%$ considering all days of the year or Drought Risk $\geq 60\%$ were inserted (SUDENE, 2021). Some authors, such as Letras Ambientais (2022), have correctly inserted territorial continuity.

The 2017 (SUDENE, 2017) and 2021/2022 (SUDENE, 2021; IBGE 2022a)

however, they did not carry out these mappings, which makes the level of participation of each Biome, and its transitions, in the region confusing. Thus, some planning and public policies are not endorsed, nor implemented correctly, because there is no deeper delimitation in terms of biomes, interfering in scenarios and actions to be taken.

The 2021/2022 update was judicialized, and it was only accepted in January 2024. Thus, there is a gap between the 2005 and 2021/2022 updates in terms of the contribution of the Cerrado, Atlantic Forest, and Cerrado Biomes in the SAB/RSA and, consequently, which interventions can be strengthened for each space. For example, agroforestry systems (AFS) can be better used in an Atlantic Forest and Cerrado environment, due to higher rainfall and the nature of soils. Cisterns, underground dams and xerophytic crops are

more classified for the semi-arid environment of the Caatinga, characterized by a more irregular water regime and young soils.

Thus, this research proposed to update the delimitation of the Semi-arid region, considering the expressiveness of the biomes and their transitions, in order to provide subsidies for more effective planning and public policies aimed at the sustainable development of the region.

METHODOLOGY

To carry out the research, the Brazilian Semi-arid Region (IBGE, 2022a) was accessed to obtain the updated list of municipalities belonging to the Semi-arid region from the 2021 delimitation. In Territorial Areas (IBGE, 2022b) the updated areas were obtained, in km², of each municipality. And, finally, in Biomes (IBGE, 2019) the biomes, or their transitions, to which they belonged were obtained from each municipality. The results resulted in three Microsoft Excel spreadsheets, where only the municipalities belonging to the Semi-arid region were separated, since the spreadsheets of Territorial Areas and Biomes refer to all Brazilian municipalities. From a matrix spreadsheet, the states belonging to the Semi-arid (MA, PI, CE, RN, PB, PE, AL, SE, BA, MG and ES) and, for each one, the biomes and their respective transitions were listed. For the values obtained for the Caatinga, Caatinga/Cerrado Transition, Caatinga/Atlantic Forest Transition and Caatinga/Cerrado/Atlantic Forest Transition, the Caatinga Complex was called Caatinga Complex due to the predominance of this Biome. The values obtained for the Cerrado and Cerrado/Atlantic Forest Transition were called the Cerrado Complex. The tabulated data resulted in tables and percentages of contribution of each biome and its complexes in the semiarid space.

RESULTS

The current Brazilian Semi-arid Region - SAB, or Semi-arid Region - RSA, has an area of 1,318,750.00 km² and 1,477 municipalities IBGE (2022a) being formed by parts of the states of MA, PI, CE, RN, PB, PE, AL, SE, BA, MG and ES. Of these 1,477 municipalities, 925 (62.62%) are inserted in the Caatinga Biome and 226 (15.30%) in their transitions (Chart 1). Therefore, the participation of the Caatinga Complex in the SAB/RSA is 1,151 municipalities or 77.92% of the total.

Table 01 - Caatinga Biome in the Brazilian Semi-arid Region

State	Mun No.	unSABn°	Mun SAB %	State Area km ²	SAB Area km ²	Biome /State Transi tion %
Caatinga Biome						
Total	2.429	925	37,9 2	1.809.037,91	694.073,47	38,37
Caatinga/Cerrado Transition						
Total	1.711	128	7,48	1.732.681,38	261.486,458	15,09
Caatinga/Atlantic Forest Transition						
Total	1.168	95	0,34	821.874,00	50.923,78	6,20
Caatinga/Cerrado/Atlantic Forest Transition						
Total	1.270	03	0,24	1.151.274,41	4.447,65	0,39
Grand Total	2.554*	1.151	45,0 6	2.138.689,40 **	1.010.931,3 58	47,26

Source: IBGE (2019). IBGE (2022a). IBGE (2022b). **Sum of the municipalities of each surveyed state.

*Sum of the areas of each surveyed state. Mun = Municipalities.

RESULTS

The results revealed that students value, above all, the qualities of dialogue, empathy and acceptance in teachers who had a positive impact on their academic trajectories. These qualities reflect the impact of a pedagogical practice guided by human values and dialogicity, in which the teacher acts as a facilitator of the integral development of students. These values, represented by loving-kindness and fraternity, sustain the relationship between teachers and students, creating an environment of care and inclusion. The analysis of the answers revealed four main categories that summarize the teaching practices most valued by the students: (1) Dialogue and Active Listening, which strengthens the teacher-student bond and increases academic engagement; (2) Empathy and Acceptance, essential for the creation of a safe and motivating environment; (3) Respect and Inclusion, fundamental to ensure equity in access to learning; and (4) Incentive to Critical Thinking, which promotes intellectual and reflective autonomy in students. Next, each of these categories is presented in detail, with representative statements from the students and a comparison with the literature reviewed.

1. Dialogue and Active Listening

Dialogue and active listening were aspects widely highlighted by the students as fundamental teaching practices. Teachers who encourage dialogue create a safe space where students feel comfortable expressing their ideas and emotions. This environment of respect and openness contributes to meaningful learning, where the student feels part of the educational process and is encouraged to actively participate.

- S1: "My teacher always listened to my opinions and gave me space to question, even if I didn't have the right answer."

- S2: "She always said that dialogue was a two-way street and that, in order to teach, she had to listen first."
- S3: "That teacher who encouraged me to speak without fear was the one who made me like the subject."
- S4: "Knowing that I can share my doubts and be heard has made all the difference for me."
- S5: "The environment of respect created by the teacher, where he listened to each one of us, made me realize that my opinion mattered."

These reports corroborate the view of Freire (1992) and Hooks (1994), who highlight the role of loving-kindness and active listening in the construction of a transformative educational environment. In addition, the findings align with the contributions of Rogers (1969) on the importance of an empathetic environment for meaningful learning, as well as the UNESCO (2013) guidelines on promoting a culture of peace in education. As described in the literature, the practice of active listening improves student engagement and strengthens the teacher-student relationship, essential aspects for a healthy educational environment. By opening space for students to express their opinions, teachers not only promote active participation, but also consolidate a pedagogical practice where the student is valued. This confirms the perspectives of Freire (1992) and Hooks (1994) on the importance of dialogue for a liberating and critical education, in addition to complementing the concept of empathy presented by Rogers (1969), which suggests that the teacher should create a safe and respectful space.

2. Empathy and Welcoming

Many students mentioned that professors who showed empathy and acceptance made a difference in their academic life. These teachers stood out for being attentive to the students' difficulties, promoting an environment of support and encouragement.

- S1: "When I struggled, my teacher was understanding and helped me find ways to overcome the challenges."
- S2: "She listened to me when I needed it and never judged me, this gave me the strength to continue."
- S3: "Knowing that he understood my personal problems made me feel safer to study."
- S4: "Even when I failed, my teacher welcomed me and encouraged me to try again."

- S5: "The welcome I received from the teachers was fundamental for my growth. They really cared."

Empathy allows the teacher to better understand the individual needs and difficulties of students, facilitating the creation of personalized pedagogical strategies, something essential for an inclusive and respectful education. This practice reflects the value of loving-kindness, where the teacher acts with care and promotes a welcoming and humane environment, attending to the student's emotional well-being. These observations confirm Freire's (1992) approach of lovingness, where the teacher acts with care and promotes a safe environment for the student's growth. This welcoming also dialogues with Hooks' (1994) ideas about teaching as a practice of freedom, a practice that transcends academic content and is genuinely concerned with the student's emotional well-being. These findings reinforce what the literature defends, showing that empathy and acceptance are essential traits to create an education based on respect and inclusion.

3. Respect and Inclusion

Respect was another core value identified by the students, who mentioned the importance of being treated with dignity and without prejudice. Teachers who adopt an inclusive and respectful stance foster an environment where every student feels valued, regardless of their cultural, social, or economic differences.

- S1: "I have always been treated with dignity, I have never felt less than my colleagues because of my origin."
- S2: "The inclusion practiced by the teacher was inspiring. He treated us as equals."
- S3: "In every class, he stressed that diversity was something we should value."
- S4: "The teacher's respectful posture made me see that I was really part of that environment."
- S5: "I have never felt discrimination or prejudice. I was embraced for who I was, and that changed my academic experience."

Students value an environment where everyone feels welcomed and respected. This respect is aligned with the value of fraternity, where the teaching practice is inclusive, promotes dignity and values the uniqueness of each student. This respect is aligned with the concept of fraternity described by Rogers (1969), where the teacher acts to create a welcoming and inclusive environment. The literature emphasizes that, by valuing diversity and treating each student with dignity, the teacher promotes an environment that

transcends cultural and social barriers, becoming a space for growth and appreciation of differences. These results also connect to UNESCO's guidelines on culture of peace, indicating that respect and inclusion are key to building a just and equitable school environment.

4. Encouraging Critical Thinking

Teachers who encourage critical thinking were praised by students, who stressed the importance of questioning and reflecting on knowledge, rather than simply memorizing it.

- S1: "My teacher always told me to question everything, and that helped me grow as a person."
- S2: "He didn't want us to memorize; He wanted us to understand and reflect on each point."
- S3: "I learned that thinking critically is more important than memorizing answers."
- S4: "The debates in the classroom helped to develop my capacity for reflection."
- S5: "He taught me that it's okay to question, that it's part of learning."

Encouraging critical thinking stimulates curiosity and the development of analytical skills, which are essential for forming critical citizens who are aware of their role in society. This incentive represents an extension of the values of loving-kindness and fraternity, because by promoting intellectual autonomy, the teacher helps to build an education where the student feels valued and supported in his individuality and freedom of thought. The promotion of critical thinking reflects the ecosystem thinking of authors such as Capra (1996) and Morin (2000), who value the complexity and interdependence of human knowledge and experiences. This practice is in line with the ecosystem perspective, which argues that knowledge is built in a collaborative and transdisciplinary way, fostering reflection and critical analysis. These findings confirm the view of the literature, reinforcing the importance of promoting questioning and reflection in an education focused on the integral formation of the student.

ANALYSIS OF STUDENTS FROM VARIOUS COURSES

Although the main analysis focused on the 370 students from specific courses, the statements of the other 359 students from different courses also reflect the same main categories: dialogue and active listening, empathy and welcoming, respect and inclusion, and encouragement of critical thinking. These reports corroborate the importance of the values of loving-kindness and fraternity, regardless of the area of training, revealing a

universal demand for inclusive and humanizing pedagogical practices. Their perceptions confirmed the universality of these pedagogical values, showing that they are widely valued, regardless of the course or area of training.

Regarding **Dialogue and Active Listening**, a Business Administration student commented: "The professor always encouraged everyone's participation and made a point of listening to what each one had to say" (E371), while an Engineering student observed: "The way the professor listened to our doubts and respected our opinions created a safe environment for learning" (E372). These statements reinforce the understanding of Freire (1992) and Hooks (1994), who emphasize the value of active listening as part of a dialogical and transformative education. The practice of dialogue, by encouraging listening and respect, strengthens student engagement and consolidates a relationship of trust, fundamental elements for the development of a liberating education.

In the **Empathy and Welcoming** category, students from different courses mentioned the importance of teachers who demonstrated understanding and support. One Biological Sciences student stated, "I always felt that my professor understood my challenges and was there to support" (E373), while another Architecture student mentioned, "He noticed when we were overwhelmed and adjusted the way we taught" (E374). These statements reinforce Freire's (1992) ideas about loving-kindness, where the teacher must act with care and understanding to create a safe and welcoming environment. This concept is also in line with Hooks' (1994) view of teaching as a practice of welcoming and liberation, suggesting that empathy is an essential element for a truly inclusive pedagogical practice.

Regarding **Respect and Inclusion**, the speeches of students from different courses also demonstrated the importance of an environment in which everyone feels respected and valued. An International Relations student reported: "I was treated with great respect, and he always made it clear that everyone had the same value in the classroom" (E375). This respect is central to inclusive pedagogical practice and aligns with Rogers' (1969) view of the importance of creating an environment of respect and inclusion, where each individual is seen as a complete and unique being. This approach is reinforced by UNESCO guidelines for the promotion of a culture of peace, showing that respect for diversity is essential for building a fair and equitable school environment.

In the case of the **Incentive to Critical Thinking** category, the students' statements also show the appreciation of teachers who stimulate questioning and reflection. One physics student commented: "I was always encouraged to question and not accept everything without thinking" (E377), while another communication student observed: "Curiosity and reflection were stimulated, which helped me develop a critical view" (E378).

These reports are aligned with the ecosystem thinking of Capra (1996) and Morin (2000), who value the complexity of knowledge and defend an education that stimulates interdependence and critical reflection. By promoting critical thinking, the teacher allows the student to actively position himself in his learning process, which is essential to form conscious and engaged citizens.

These observations indicate that, although the 370 students from the most representative courses formed the basis of the analysis, the reports of students from different courses corroborate the universality of the qualities valued, regardless of the area of study. The alignment between the groups reinforces that pedagogical practices based on loving-kindness and fraternity not only improve the educational environment, but also contribute to a peaceful and collaborative coexistence. Such practices, by promoting dialogue, empathy, respect and critical thinking, stand out as fundamental for the creation of public policies that encourage the formation of inclusive school environments, contributing to the integral development of students and the construction of a more just and humanizing society.

The findings of this study reinforce the need for a humanizing and inclusive pedagogical approach, based on lovingness and fraternity. The appreciation of these practices by students demonstrates their effectiveness in building a welcoming and engaging learning environment. Considering the relevance of these factors for educational development, it is suggested that public policies and teacher training programs be reformulated to include strategies that promote respect, inclusion and the strengthening of interpersonal relationships in the school context.

PUBLIC POLICY PROPOSAL

Based on the results obtained in this study, which highlight the positive impact of teaching practices based on the values of dialogue, empathy, respect, inclusion and encouragement of critical thinking, we propose guidelines to support the construction of public policies aimed at education. These policies should seek the humanization of the school environment and the promotion of a culture of peace, aligned with the principles of loving-kindness and fraternity in pedagogical practice. Below are the main recommended guidelines, accompanied by justifications based on the data and the reviewed literature.

1. Continuing Education of Teachers in Socio-emotional and Inclusive Skills

- Justification: The results showed that students deeply value qualities such as empathy, warmth and respect in teachers, which confirms the importance of an educational practice guided by human values. As emphasized by Freire (1992) and

Hooks (1994), a truly transformative education requires that teachers have training that transcends technical content and contemplates socio-emotional skills.

- Guideline: Implement continuing education programs for teachers that include the development of socio-emotional skills and inclusive practices. These programs should cultivate loving-kindness and fraternity in teachers, values that act as essential plants to nurture a welcoming and inclusive school environment. These trainings should prepare teachers to deal with diversity, practice active listening, welcome differences and promote an environment that supports the integral development of students.

2. Promotion of Peace Culture in Schools

- Justification: The appreciation of respect and inclusion by students highlights the need for environments where everyone is treated with dignity and equity, without discrimination. The literature, including UNESCO guidelines for the promotion of a culture of peace, reinforces the importance of environments that value cultural, social and economic diversity.
- Guideline: Institute policies that ensure the inclusion of all students in the school environment, promoting respect for diversity and combating discriminatory practices. In addition, it is essential that schools implement awareness programs on the value of differences, creating a space where diversity is understood as a resource and a fundamental right. The promotion of a culture of peace in schools must be based on fraternity, creating a fertile ground for harmonious coexistence and collaboration.

3. Incorporation of Ecosystem Thinking into Education

- Justification: Ecosystem thinking proposes an integrative view of the educational environment, understanding it as an interconnected system, where each element – teachers, students, content and context – relates and influences each other. This perspective maintains that the success of the school environment depends on the quality of the interactions established between its members. Ecosystem thinking, as defended by Capra (1996) and Morin (2000), values the complexity and interdependence of knowledge, emphasizing that education should encourage questioning and critical analysis.
- Guideline: Ecosystem thinking should be integrated into educational guidelines, encouraging an interdependent and holistic view of the educational process. By integrating ecosystem thinking with education, we encourage a school environment

seen as a garden, where loving-kindness and fraternity are central plants that sustain relationships and promote the growth of all. This approach can be promoted through practices of inclusion, dialogue, and respect that strengthen the development of a balanced and collaborative educational environment.

4. Creation of Spaces for Reflection and Dialogue in School Daily Life

- Justification: The analysis of this study and UNESCO recommendations highlight the relevance of an education that promotes a culture of peace, dialogue and the peaceful resolution of conflicts. Students reported that environments where there is dialogue and active listening significantly improve coexistence and well-being.
- Guideline: Establish coexistence programs in schools that encourage a culture of peace, dialogue and the peaceful resolution of conflicts, with the active participation of students, teachers and the school community. These spaces allow the values of loving-kindness and fraternity to take root in the school routine, strengthening interpersonal relationships and promoting a more humanizing education. As demonstrated in the students' reports, active listening and dialogue are fundamental for a welcoming and collaborative environment, offering opportunities for the integral development of students.

5. Implementation of Teacher Evaluation Policies Based on Humanizing Competencies

- Justification: The humanizing teaching practice was mentioned as a differential by the students, who reported the importance of being treated with empathy, acceptance and respect. To ensure that these values are sustained in practice, it is important that the teacher evaluation also takes into account these competencies.
- Guideline: Create teacher evaluation policies that include, in addition to technical skills, indicators of humanizing practices, such as empathy, active listening, respect and the ability to promote inclusion. The evaluation should value teaching practices that cultivate loving-kindness and fraternity in the educational environment, reinforcing the importance of these values for a transformative education. These evaluations can be applied through feedback from students and the school community, encouraging teachers to develop and maintain a welcoming and inclusive pedagogical posture.

These guidelines seek to foster an educational practice that prioritizes human development, inclusion, and the construction of a culture of peace, transforming the school environment into a space of welcome and respect. By subsidizing public policies with these values, it is expected that schools will become places of harmonious coexistence and integral education, contributing to the development of a more just and equitable society. Thus, loving-kindness and fraternity, like the two central plants of the educational garden, nourish school coexistence and strengthen the foundations for an education that promotes integral human development and social peace.

FINAL CONSIDERATIONS

The findings of this study demonstrate that the development of an educational practice based on the values of loving-kindness and fraternity can significantly transform the school environment, promoting a peaceful, inclusive and collaborative coexistence. Returning to the metaphor of the educational garden (FREIRE, 1996), we observe that teachers who cultivate these values act as gardeners who take care of the educational soil, preparing a fertile space where each student can grow and develop fully, integrating himself into the educational ecosystem. Thus, the values of dialogue, empathy, respect and encouragement of critical thinking work as essential nutrients in this garden, providing the integral development of students and a truly humanizing educational experience. Lovingness and fraternity, like the two central plants, sustain this ecosystem, nurturing relationships and ensuring an environment where everyone is respected and welcomed.

The results showed that these qualities are widely valued by students, regardless of the course or area of training. Teachers who practice active listening, promote inclusion, and encourage critical analysis stand out as central figures in building an education that values human and social development. In order for these values to be systematically incorporated into the educational environment, we propose guidelines aligned with the public policies previously suggested, now reinforced by data and literature:

CONTINUING EDUCATION OF TEACHERS IN HUMANIZING AND INCLUSIVE SKILLS:

Public policies should include continuing education programs that emphasize the importance of lovingness and fraternity as pillars of teaching practice. These programs should address active listening techniques, empathy, and encouragement of critical thinking, promoting the development of a pedagogical practice that values dialogue and inclusion. The valorization of these qualities, widely defended by Freire (1992) and Hooks

(1994), is confirmed by the results of this study, which demonstrate the positive impact of these practices on the education of students.

PROMOTION OF A CULTURE OF PEACE IN SCHOOLS:

The creation of programs that encourage a culture of peace in the school environment is essential for building a respectful and collaborative coexistence. Public policies should encourage actions that promote respect for diversity and the peaceful resolution of conflicts, contributing to the creation of a safe and welcoming environment for all students. This guideline is aligned with both the principles of fraternity and respect observed among students and the UNESCO guidelines, which reinforce the importance of an environment of respect for the construction of a culture of peace.

INCORPORATION OF ECOSYSTEM THINKING INTO EDUCATION:

Ecosystem thinking must be integrated into educational guidelines, encouraging an interdependent and holistic view of the educational process. The school should be seen as an ecosystem where all elements – teachers, students, content and context – relate to and influence each other. In this fertile soil, lovingness and fraternity become the core values that sustain the balance and development of all its members. This perspective, based on the concepts of Capra (1996), Morin (2000) and Moraes (2004), maintains that the school environment works as a living network, where practices of inclusion, dialogue and respect promote the balance and development of all its members.

CREATION OF SPACES FOR REFLECTION AND DIALOGUE IN EVERYDAY SCHOOL LIFE:

Schools should be encouraged to create spaces for dialogue and reflection, where teachers and students can discuss and share their experiences and perspectives. These spaces allow the values of lovingness and fraternity to be incorporated in a practical way into the daily school life, strengthening interpersonal relationships and promoting a more humanizing education. As demonstrated in the students' reports, active listening and dialogue are fundamental for a welcoming and collaborative environment, offering opportunities for the integral development of students.

IMPLEMENTATION OF TEACHER EVALUATION POLICIES BASED ON HUMANIZING COMPETENCIES:

The implementation of these guidelines must be accompanied by mechanisms for evaluating and monitoring pedagogical practices, based on humanizing competencies, such as empathy, respect, and the ability to promote inclusion. This monitoring is essential to identify good practices, ensure that teachers continue to develop skills aimed at welcoming and adjust policies according to the needs of the educational environment. Assessments that include student feedback are key to ensuring that teaching practice continues to foster an environment of inclusion and respect.

We conclude that an education guided by loving-kindness and fraternity is essential for the construction of an inclusive and transformative school environment, which contributes to the formation of citizens committed to peaceful coexistence and social development. The present study offers subsidies for the formulation of public policies that promote the appreciation of these values in the school routine, enabling the creation of an educational ecosystem that cultivates respect, empathy and cooperation. Thus, loving-kindness and fraternity, like the two central plants of the educational garden, nourish school coexistence and strengthen the foundations for an education that promotes integral human development and social peace.

FUTURE RESEARCH

Although this study has highlighted the importance of loving-kindness and fraternity in teaching practice, future research can explore concrete strategies for measuring these impacts over time. In addition, comparative investigations between different educational contexts can provide subsidies for the adaptation of these practices in different realities.

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