Environmental Education in the context of Brazil's New High School Curriculum: An Integrative Review

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Abstract
The New High School reform in Brazil aims to offer an education aligned with contemporary societal demands but requires careful planning and implementation. This study sought to contextualize Environmental Education within this framework through an integrative review of scientific literature published between 2018 and 2023. Most of the selected studies were produced in the state of São Paulo (14.54%), followed by Santa Catarina (12.72%), Pernambuco, and Rio Grande do Sul (9.09%). Approximately 60% of the studies focused on the continuing education of high school students. Regarding curriculum integration, 85.45% of the studies addressed themes aligned with the New High School guidelines. As for theoretical and methodological frameworks, Critical Environmental Education was the most prevalent, appearing in 50.91% of the cases. Among the academic works analyzed monographs (39.58%), dissertations (52.08%), and theses (6.25%) — 33.33% originated from the Northeast region and 22.92% from the Southeast. Furthermore, 70.83% were integrated into the New High School curriculum, while 29.16% were not. The investigative method was the most widely employed (31.25%), followed by documentary/theoretical analysis (25%). Overall, Critical Environmental Education remained the dominant framework, accounting for 47.91% of the research analyzed.

Keywords:
public policies; critical environmental education; curriculum; BNCC; basic education

Educação Ambiental no contexto do Novo Ensino Médio: uma revisão integrativa

Resumo
O Novo Ensino Médio busca uma educação alinhada à sociedade contemporânea, mas requer planejamento adequado. Objetivou-se contextualizar a Educação Ambiental no âmbito do Novo Ensino Médio a partir da literatura científica por meio de uma revisão integrativa (2018 e 2023). Os artigos foram produzidos principalmente no estado de São Paulo (14,54%), seguido por Santa Catarina (12,72%), Pernambuco e Rio Grande do Sul (9,09%). Dentre as pesquisas, aproximadamente 60% tratam de formação contínua dos alunos do Novo Ensino Médio. No que se refere à integração com os currículos do Novo Ensino Médio, 85,45% dos temas estavam alinhados. No âmbito dos referenciais teóricos e metodológicos, a Educação Ambiental Crítica foi a mais explorada, representando 50,91% dos casos. Ao examinarmos as monografias (39,58%),

dissertações (52,08%) e teses (6,25%), verificou-se que 33,33% provêm da região Nordeste, enquanto 22,92% do Sudeste. Além disso, 70,83% estão integradas ao currículo do Novo Ensino Médio, enquanto 29,16% não se alinham. O método investigativo foi amplamente adotado (31,25%), seguido pela análise documental/teórica (25%). Em relação aos marcos teóricos/metodológicos, a Educação Ambiental Crítica se destacou (47,91%).

Palavras-chave
políticas públicas; Educação Ambiental Crítica; currículo; BNCC; Educação Básica.

Educación Ambiental en el contexto del Nuevo Bachillerato: una revisión integradora

Resumen
El Nuevo Bachillerato busca una educación alineada con la sociedad contemporánea, pero requiere una planificación adecuada. Se objetivó contextualizar la Educación Ambiental en el ámbito del Nuevo Bachillerato a partir de la literatura científica mediante una revisión integradora (2018-2023). Los artículos se produjeron principalmente en el estado de São Paulo (14,54%), seguido de Santa Catarina (12,72%), Pernambuco y Rio Grande do Sul (9,09%). Aproximadamente el 60% de las investigaciones tratan sobre la formación continua de los estudiantes del Nuevo Bachillerato. En cuanto a la integración con los currículos del Nuevo Bachillerato, el 85,45% de los temas estaban alineados. En los referentes teóricos y metodológicos, la Educación Ambiental Crítica fue la más explorada, representando el 50,91% de los casos. Al examinar las monografías (39,58%), disertaciones (52,08%) y tesis (6,25%), se observó que el 33,33% provienen de la región Nordeste, mientras que el 22,92% provienen del Sudeste. Además, el 70,83% están integradas en el currículo del Nuevo Bachillerato, mientras que el 29,16% no están alineadas. El método investigativo fue ampliamente adoptado (31,25%), seguido del análisis documental/teórico (25%). En relación con los marcos teóricos/metodológicos, la Educación Ambiental Crítica se destacó (47,91%).

Palabras clave
políticas públicas; Educación Ambiental Crítica; currículo; BNCC; Educación Básica.

1 Introduction

Education in Brazil is standardized through the Constitution of the Federative Republic of Brazil of 1988, as a social right of each citizen (Brasil, 1988). Among the relevant laws for Brazilian Education is the Law of Guidelines and Bases of National Education (LDBEN) nº 9.394/1996, which establishes the guidelines and bases of National Education, the National Education Plan, Law nº 10.172/2001, which deals with the educational plan designing guidelines and goals for the ten-year term, providing for

actions for state and municipal education plans, Law nº 13.005/2014, which approves the National Education Plan as of the publication of this law, complying with the provisions of article 214 of the Federal Constitution, and Law nº 13.415/2017, which amends the LDBEN and establishes changes in the structure of High School, extending the minimum time of the student in school from 800 to 1,000 hours per year, in addition to proposing a more flexible curriculum (Ferretti; Silva, 2017; Koepsel; Garcia; Czernisz, 2020). It also has Constitutional Amendment No. 59/2009, which recommends that Basic Education is mandatory and free from 4 to 17 years old.

High School in Brazil began to be configured with its own identity, after the enactment of Law no. 9.394/1996 (Brasil, 1996), as the final stage of Basic Education (Ferretti; Silva, 2017). This last stage of Basic Education, which aims at the construction of citizenship and the development of knowledge and intellectual autonomy, can represent the opportunity for professional training. Thus, the school curriculum, being an instrument for building democracy and citizenship, must include content and teaching-learning strategies that enable the student to live in society, in productive activities and subjective experiences (Colacios; Locastre 2020; Colagrande; Farias, 2021). The National High School Curriculum Parameters (PCNEM) bring four premises pointed out by the United Nations Educational, Scientific and Cultural Organization (Unesco): “Learning to Know, learning to do, learning to live and learning to be” (Brasil, 1999, p. 29). Like these, a set of laws are important to regulate High School in Brazilian Education. The LDBEN, in article 36, points out that the High School Curriculum Guidelines point to a proposal of organicity for the curriculum (Brasil, 1999). In this proposal, planning can be flexible, in which knowledge can be integrated and articulated with each other and between all subjects of the curriculum (Brasil, 1999). Thus, in this process we have interdisciplinarity and transdisciplinary (Brasil, 1999; Sauvé, 2005). Law no. 13.415/2017 made changes to the LDBEN, reorganizing High School. In this sense, increasing the workload of students from 800 hours per year to at least 1,000 hours per year, and should be progressively expanded to 1,400 hours per year and a maximum of 1,800 hours in the three years of High School. As a result, the increased workload led to a new curricular organization, one part of General Basic Training and the other part flexible (Brasil, 2022; Ferretti, 2018). The curricular organization is based on the National

Common Curricular Base (BNCC) and proposes the organization of curricular components in areas of knowledge: I) Languages and their technologies; II) Mathematics and its technologies; III) Natural Sciences and its technologies; and IV) Applied Human and Social Sciences (Brasil, 2022). It also proposes a flexible part, with a minimum of 1,200 hours in the three years, composed of the training itineraries: I) Life Project (PV); II) Second Foreign Language; III) Elective Curricular Components (CCEs); and IV) Deepening Trails (Brasil, 2022; Canettieri; Paranahyba; Santos, 2021).

The New High School (NEM) was implemented from 2020 in several pilot schools and in 2022 in almost all high schools in the country, including public and private institutions. These schools have been developing the proposal of the National Education Plan with the implementation of curricular matrices, whose components present curricular flexibility throughout the three years of High School. NOR DOES it "[...] intend to meet the needs and expectations of young people, strengthening youth protagonism" (Brasil, 2022; Carvalho; Cavalcanti, 2022; Colacios; Locastre, 2020). The NEM format proposes to meet the needs and expectations of students, in which they can be protagonists of their studies. In this format, the student has the opportunity to choose the training itineraries they will attend, so that they can deepen their studies in the areas of knowledge with which they have the most interest and affinity. This measure aims to ensure the permanence and learning of students in school (Santa Catarina, 2021).

Environmental Education has been discussed in social spaces (Colagrande; Farias, 2021). It is built in the relations of society with the environment in which individuals are inserted and social relations are building values and knowledge (Menezes; Miranda, 2021; Ocampo *et al.*, 2018). The Federal Constitution (1988) establishes in article 225 that: "[...] Everyone has the right to an ecologically balanced environment, a good for the common use of the people and essential to a healthy quality of life [...]". Assuming that Environmental Education is and/or will be included in pedagogical materials and practices, at all stages of High School, it is possible to identify the potentialities and weaknesses that the NEM training process brings to students and the school community with regard to the Environmental Education theme through bibliographic analyzes (Oliveira; Neiman, 2020).

In this sense, the present study aimed to analyze what the scientific literature reports on the insertion of Environmental Education in the context of NEM between 2018 and 2023. Our general objective was to contextualize Environmental Education within the scope of NEM from the scientific literature available between 2018 and 2023. Thus, we mapped and described how Environmental Education is being inserted in the context of NEM through a literature review contemplating studies published from 2018 to 2023. We also sought to identify the potentialities and weaknesses of Environmental Education in the student's training process in NEM through an integrative review. The research drew on key legal and normative documents as its theoretical foundation of High School in the state of Santa Catarina, as well as the NEM (Almeida *et al.*, 2019; Sidone; Haddad; Mena-Chalco, 2016).

2 Methodology

The present study used the integrative literature review as a methodological approach, a type of review that allows gathering, analyzing and synthesizing results of empirical and theoretical research to provide an expanded understanding of the state of knowledge. In the field of Education and Environmental Education, this methodology has been used to identify predominant theoretical approaches, application contexts and challenges in educational policies and practices. The choice of the integrative review is justified in view of the methodological and thematic diversity of studies on the insertion of Environmental Education in the NEM. The process followed the steps proposed by Souza, Silva and Carvalho (2010): (1) formulation of the research question, (2) definition of inclusion and exclusion criteria, (3) identification of information sources, (4) categorization of studies, (5) critical analysis of results and (6) synthesis of knowledge.

This research has a qualitative and quantitative approach and a documentary character, with the main source of data collection being the analysis of articles, dissertations and theses that explore the theme of Environmental Education in the context of NEM. Thus, a survey was made in the scientific literature on this subject. For the selection of materials, the following descriptors were used: "Environmental Education", "New High School" and "BNCC", to evaluate Environmental Education in the

new school context. The material selection criterion took into account articles, dissertations and theses that deal with Environmental Education in the context of schools that implemented NEM. For the documentary analysis of scientific articles, documents available in journals accessed by the Google Scholar platform were sought, while dissertations and theses were accessed by the platform of the Brazilian Digital Library of Dissertations and Theses (BDTD). The unfiltered results of Google Scholar and BDTD are arranged on the respective *links* consulted on August 26, 2022. The choice of Google Scholar and BDTD as search sources is based on the specific objective of this study to capture the greatest possible diversity of academic publications on Environmental Education in the context of NEM.

The selection of articles, dissertations and theses complied with the following inclusion criteria: 1) contain the words "Environmental Education" and/or "New High School" in the title, keywords or abstract; 2) jointly address the themes of Environmental Education in NEM; 3) be related to Brazilian Education; and 4) for articles, be in a relevant publication classified in the Qualis of Journals of the Coordination for the Improvement of Higher Education Personnel (Capes) updated in 2020, having a minimum classification in stratum C. A bibliographic review for the purpose of theoretical basis was carried out, making a historical rescue of the implementation of High School, its implementation and implementation over time. This rescue contemplated the demands on schools in general, the challenges and changes in the course of high school. Then, the insertion of Environmental Education in the curricula of Basic Education. Subsequently, the data collected from this research was discussed. All documents were analyzed following the assumptions of the content analysis of Bardin (1977), following three steps: 1) pre-analysis, which consists of the selection of documents, construction of hypotheses, objectives and formulation of descriptors; 2) coding of information extracted from the text; and 3) treatment of results, inference and interpretation of data. The analysis categories for each document were tabulated and their percentages computed. Since each document could present more than one data constitution instrument and data analysis methodology, the frequency for each category was divided by the total number of instruments or methodologies identified and multiplied by 100.

3 Results

3.1 Selection of documents

The initial research in the bibliography revealed about 1,130 studies related to the proposed theme: "Environmental Education in the New High School". Following a thorough analysis based on the content analysis approach of Bardin (1977) in the three mentioned stages, 1) pre-analysis, 2) coding of the information extracted from the text and 3) treatment of the results, inference and interpretation of the data, 55 articles that fully met the pre-established criteria and methodological guidelines were identified and selected. Within this same context, 48 works were also found, including dissertations, theses and monographs. Within the set of selected studies, the articles represented 53%, while the other scientific works corresponded to 47%.

3.2 Articles in scientific journals

A diverse range of publications in the form of scientific articles was identified, encompassing a total of 34 distinct journals. Standing out in this scenario, *Revista Brasileira de Educação Ambiental* (Revbea) emerged as the main platform, hosting 18.18% of articles related to “Environmental Education in the New High School”. In the last five years, the magazines *Retratos da Escola* and *Research, Society and Development* contributed with four articles each on the subject, totaling 7.27% of the selections. The *Electronic Magazine of the Master's Degree in Environmental Education* (Remea) also stood out, with 5.45% of the articles focused on this topic. An analysis of Capes Qualis extracts on the Sucupira platform for the selected publications revealed a wide range of classifications. Most of the chosen publications achieved the Qualis A3 classification (41.81%), while the Qualis A4 and C classifications comprised 14.54% of the analyzed documents. In contrast, publications classified as A1 represented only 1.82% of the set of documents analyzed.

When observing the institutions involved, public institutions stood out with a remarkable productivity of 76.36%, while private institutions participated with a more

modest contribution of 16.36%. The Community institutions had a more discreet representation, covering only 3.63%. With regard to collaboration between authors, most studies resulted from the joint efforts of two (40%) or three authors (25.45%). About 18.18% of the works were the result of the individual work of a single author, while only 9.09% involved five or more authors. It is interesting to note that approximately half of the work was conducted without other partner institutions (49.09%), while the other half (50.91%) sought partnerships with other institutions. As for geographical locations, the state of São Paulo stood out with 14.54% of the total work, followed by Santa Catarina, with 12.72%. Both Pernambuco and Rio Grande do Sul presented an equal proportion of 9.09% for each state. Regarding the representation of the sex of the authors, approximately 52.73% of the scientific productions were attributed to male authors, while 47.27% had female authorship. Considering the first authors of the articles, most of them have a master's degree (50.91%), with a remarkable diversification in their training. Authors with doctoral degrees represented 29.09%, followed by authors with undergraduate degrees, totaling 16.36%.

As for the methodologies used, qualitative research stands out, covering 90.01% of scientific articles. To a lesser extent, 9.09% of the studies adopted a combined approach of qualitative and quantitative methods. It is observed that most of the works were based on bibliographic research or bibliographic reviews, followed by documentary/theoretical analysis. Some research has also adopted the case study methodology or reported experiences. In addition, there were cases of investigative or descriptive approaches. Among the surveys, approximately 60% were considered integrated, while 40% did not directly address the continuing education of high school students. Regarding the integration with the NEM curricula, 85.45% of the themes were aligned, while 14.54% were not. Within the scope of theoretical and methodological frameworks, Critical Environmental Education was the most explored, representing 50.91% of cases. Conservative Environmental Education was present in 16.36% of the studies. Other references were identified, although with a less marked presence. Research in the area of Environmental Education fits mainly in the Natural Sciences and their technologies, although there are also productions in the Human Sciences and their technologies. Considering the focus on High School, there is a significant representation

in the broader category of Education in general, with work that did not fit specifically in any area (action-intervention). A remarkable fact is the growing trend towards interdisciplinarity, reflected in works that encompass all areas of knowledge, which represents an important step in Environmental Education.

3.3 Analysis of monographs, dissertations and theses

Most monographs, dissertations and theses were prepared in 2022, covering 43.75% of the total. In 2021, there was a representation of 20.83%, while 2019 registered a lower production, with 8.33% (excluding 2023 from this analysis). Within the set of 48 works analyzed, dissertations represented 52.08%, followed by monographs, with 39.58%, theses, with 6.25%, and specialization works, with 2.08%. As for institutions, federal universities stand out significantly, contributing with 28 works whose authors are linked to these institutions, totaling 58.33%. On the other hand, seven studies came from authors linked to state institutions, which represents 14.58% of the total. A striking characteristic of these scientific works is the tendency to individualization, and the absence of partnerships with other institutions is frequent. Generally, both the academic and the advisor belong to the same institution. Academic backgrounds vary between undergraduate, master's and doctoral degrees. Regarding the sex of the first authors, there is a remarkable parity, with 52.08% being female and 47.91% male.

Regarding the geographical distribution of the works, it is verified that 33.33% of them come from the Northeast region, while 22.92% were produced in the Southeast region. The Central-West region and the South region have the same representation, with 16.66% each, while the North region contributed with 10.42%. Most studies address the continuing education of students (60.42%), while 39.58% deal with topics not directly linked to student learning. In addition, 70.83% are integrated into the New High School curriculum, while 29.16% do not align. Regarding the methodology used, 83.33% of the studies used qualitative research, while 14.58% opted for qualitative and quantitative approaches. Only 2.08% of the studies used quantitative research. In all, 85.42% are related to the area of Natural Sciences and its technologies, which is also the area of knowledge with the highest production during the study period. The area of Human and

Social Sciences contributed 8.33% of the research, while 6.24% turned to the area of Education in general, without specifying the area of knowledge. No studies were found in the area of languages and their technologies.

It is important to highlight that the investigative method was widely adopted, representing 31.25% of the research, followed by documentary/theoretical analysis, with 25%. The descriptive method corresponded to 14.58% of the studies; the bibliographic method, to 12.5; the exploratory method, to 6.25%; and case studies, to 4.16%. Other methods, such as interventionist, experimentation and participatory, represented 2.08%. Regarding the theoretical-methodological frameworks, Critical Environmental Education stood out, representing 47.91% of the research. Pragmatic Education comprised 18.75% of the work carried out during the period under analysis. Conservative Education and the interdisciplinary approach in Environmental Education were equally represented, with 10.41% each. Other works, totaling 12.5%, did not clearly define the adopted aspect and were grouped under the theme Education.

4 Discussion

4.1 Environmental Education in NEM

The educational reform that culminated in the introduction of NEM in Brazil in 2017 may have represented an important milestone in the search for an education more aligned with the needs and challenges of contemporary society (Ferretti; Silva, 2017). This would require a multidisciplinary team to plan actions, which is not the reality of most of these. Initially, this reform aims to prepare students to deal with a constantly evolving world, as this reform not only modified the curriculum structure, but also emphasized the importance of addressing topics relevant to the current context (Koepsel; Garcia; Czernisz, 2020). On the other hand, it becomes dependent on serious and deep action planning (Carvalho; Cavalcanti, 2022). In the ideal planning and resource scenario, Environmental Education can emerge as a crucial pillar in NEM (Colacios; Locastre 2020). Its role goes far beyond transmitting knowledge about the environment; it has the

mission of cultivating a critical and conscious understanding of environmental issues, as well as fostering the development of practical skills aimed at sustainable solutions (Colagrande; Farias, 2021). By providing students with tools to analyze complex problems, considering social, economic and ecological aspects, Environmental Education enables them to be more responsible and active citizens in relation to their surroundings (Sauvé, 2005).

In recent years, Brazil has faced a series of environmental challenges of significant magnitude (Artaxo, 2020). Deforestation, biodiversity loss, pollution and climate change are just a few examples. This is where Environmental Education comes into play (Jacobi *et al.*, 2011). By addressing these problems in a didactic and engaging way, it not only informs but also inspires action (Colagrande; Farias, 2021). The goal is to create widespread awareness, motivating individuals to adopt more sustainable practices in their daily lives and to push for changes at broader levels (Ocampo *et al.*, 2018). The increase in the production of scientific papers related to the descriptors “New High School” and “Environmental Education”, with a peak in 2022, reflects the growing attention and interest around these themes. A plausible explanation for this trend is the increase in the number of graduate programs in the area of Environmental Sciences, by region, until 2018 (Almeida *et al.*, 2019). This substantial growth, in the order of 137% to 250% over seven years, reveals a search for knowledge and research that contributes to the understanding and improvement of Environmental Education in the context of NEM (Almeida *et al.*, 2019). In summary, the synergy between NEM, Environmental Education and the increase in scientific production can demonstrate a renewed commitment to forming citizens who are engaged, aware and capable of dealing with the environmental and social challenges that define our time (Menezes; Miranda, 2021). This does not occur uniformly, and may aggravate the discrepancy between different realities. This search for understanding and innovation is an essential part of the ongoing effort to promote a culture of sustainability and responsibility in Brazil and around the world, but it must be done equally and fairly.

4.2 Most used methods in research in Environmental Education in High School

In the scenario of scientific research focused on Environmental Education in the context of NEM, the diversity of methods used is remarkable. However, researches that use documentary/theoretical analysis and bibliographic review or survey as predominant methodologies stand out. This pattern is supported by the observations of Chimello (2021), who identified an inclination towards qualitative approaches in most of the studies analyzed. This preference is justified by the ability of qualitative research to deeply immerse itself in the investigated reality, allowing a richer and more detailed contextual understanding based on the perception and meaning given by the researchers (Abad, A.; Abad, T., 2022). This movement is reflected by the emphasis on the use of qualitative approaches, as attested by Carvalho, Tomazello and Oliveira (2009). Qualitative research, intrinsically analytical, systematic and procedural, offers a holistic perspective of the research objectives, allowing a thorough exploration of the issues addressed and, consequently, generating more targeted data (Machado, 2023). This approach is widely recognized and valued as a substantial scientific construct, as Minayo (2012) argues.

It is important to highlight, however, the scarcity of quantitative research focused on Environmental Education, suggesting an area to be more widely explored, in line with the observations of Cararo (2022). Another fundamental aspect that deserves to be highlighted is the predominant theoretical-methodological approach in the research, in which critical Environmental Education stands out as the most prominent in both articles and other forms of investigation (Silveira; Lorenzetti, 2021). This focus is often pointed out as the root of the diverse and complex environmental imbalances faced globally, such as: ecosystem degradation, burning, global warming, climate change, problem with the destination of waste, species extinction, genetic mutations and air, water and soil pollution (Messias, 2023). Critical Environmental Education emerges as a response to this reality, seeking to question and critically analyze this societal model (Nogueira, 2023). This approach, in contrast to the Education for Sustainable Development approach proposed by organizations such as UNESCO and market influences, gains relevance by incorporating critical theories and complex approaches (Lima, 2009). Layrargues and Lima (2014) identified a remarkable growth of Critical Environmental Education, especially in the academic sphere, signaling its ability to overcome its traditional role of counter-hegemony. Critical Environmental Education, perceived as a

constantly evolving process, requires practical and reflective activities at school, as its nature is intrinsically linked to action (Cardozo; Queiros; Dornfeld, 2022). In addition, different approaches have emerged that deserve mention, as they do not necessarily fit into the three previously mentioned strands. This includes Education in general and curricular integration. In addition, topics such as public policies and approaches that incorporate *maker* culture and the use of digital tools emerged. This diversity suggests that technology is increasingly present in several areas of knowledge, playing a crucial role in the teaching-learning process and offering the potential to be an effective ally in Environmental Education.

4.3 Geographical expansion of research in Environmental Education

The analysis of the geographical distribution of academic production reveals that the Northeast, South and Southeast regions emerge as the main focuses of this activity. These results are in line with the observations made by Sidone, Haddad and Mena-Chalco (2016) and the findings of Cararo (2022) for the Southeast and South regions. The high scientific production in the Southeast region of Brazil is justified by the concentration of the main university institutions in the country, as well as the remarkable presence of graduate programs and a robust community of national researchers. This naturally translates into a higher proportion of academic output and a diverse approach to a wide range of topics (Melo; Oliveira, 2006). The study by Sidone, Haddad and Mena-Chalco (2016) deepens this perspective by pointing out notable differences in the geographical distribution of scientific production, with a marked concentration of publications and researchers in the Southeast region, particularly in the capitals of the states of this region. The study, however, also points to strong signs of a process of spatial decentralization in the Southeast region and an increase in relevance in the South and Northeast regions, motivated by the expansion of collaboration networks between authors (co-authorship) and the consolidation of specific networks in each area of knowledge.

In the Brazilian context, the growth of scientific production is combined with an increase in collaboration between researchers, which translates into a higher incidence of

shared production. This development is linked to investments in the national innovation system and the consolidation of the science, technology and innovation tripod. This scenario favors a remarkable optimization, as well as an increase in the quality and visibility of scientific production (Sidone; Haddad; Mena-Chalco, 2016). A notable aspect is the significant proportion of publications of articles that are published in journals classified as Qualis A (specifically A3), especially focused on the theme of Environmental Education. This phenomenon reflects the importance and centrality of this topic. However, it is also noticeable that institutions with a more economic bias tend to avoid the production of research and themes related to Environmental Education in A1-rated journals. As evidenced by Sauvé (2005), "[...] given its broad scope and the need for profound transformations, the educational project of Environmental Education undoubtedly represents a complex challenge to be carried out". The profile of the institutions from which the main authors of scientific articles come is predominantly public, including *stricto sensu* graduate studies carried out in public institutions, with emphasis on federal universities (Zanini *et al.*, 2021). This, in turn, results in the trend of relatively lower production by private universities (Cararo, 2022). In the Brazilian context, "[...] geographical distribution is closely linked to the location of the *campuses* of public universities, especially state and federal universities, which play a vital role in scientific activity" (Sidone; Haddad; Mena-Chalco, 2016).

4.4 Authors' profile

With regard to the representation of sex among the authors, a remarkable balance is observed between female and male contributions. Over time, especially after the Post-World War II period, the institutionalization process opened doors for women, changing the configuration traditionally dominated by men in the scientific scenario in the field of Education (Ferreira *et al.*, 2008). This advance did not happen without many challenges and resistance; highlighting women in the scientific and technological scenario required targeted and specific efforts (Melo; Oliveira, 2006). According to Chimello *et al.* (2021), Environmental Education has been gaining more and more space within

academic production, but it needs to be based on criteria so as not to become a superficial subject.

This transformation is evident both in the analysis of scientific articles and in dissertations, theses and monographs. A striking trend is that most works have authors linked to public universities, with the predominant presence coming from federal universities in the country, indicating the stability of public office as an important protective mechanism for women, mainly guaranteeing rights during the maternity period. This inclination again demonstrates the significant contribution of the public institutions model to academic production, especially in the sphere of Environmental Education in the context of NEM. The analysis presented shows that scientific production is predominantly rooted in postgraduate courses at the master's level, where professionals with training at this level are the main contributors. In addition, there is a significant presence of authors with a doctorate, usually the supervisors of the work. The authors' range of training is wide and diverse, covering all areas of knowledge, except the arts. Among the different formations, Advocacy/Law, Administration, Energy Technologies and Psychology deserve to be highlighted.

4.5 NEM implementation paradigms and the Environmental Education approach

The importance of Environmental Education for the country and its citizens is undeniable. This relevance, however, seems not to have been fully recognized in the BNCC (Canettieri; Paranahyba; Santos, 2021), as pointed out by Oliveira and Neiman (2020). According to Menezes and Miranda (2021), Environmental Education does not receive due consideration as a fundamental element for the integral training of Basic Education students within the BNCC. The reform of High School, in force since 2017, brought with it the flexibility of the curriculum, but also introduced a potentially limiting approach (Ferretti, 2018). In this context, it is worth mentioning that the area of Natural Sciences and its technologies emerges as the most favorable to address the theme of Environmental Education, closely followed by the area of Human Sciences and its technologies. Some research extends its investigation to cover the problems of Education as a whole, focusing on the interdisciplinarity between NEM and Environmental

Education. Interestingly, the area of Languages and its technologies does not seem to house related works. This scenario is echoed in the observations of Chimello (2021), who suggests that Environmental Education often connects more with specific disciplines, leaving gaps in the linguistic, letters and arts areas.

The practice of Environmental Education becomes fundamental in the context of the teaching-learning process, in which innovative, interdisciplinary, integrative, participatory and dynamic pedagogical approaches play a central role, directly influencing educational transformations and student training (Silva, 2022). The study carried out by Silva, Gomes and Serna (2022) offers an in-depth analysis of how Environmental Education is incorporated (or not) into educational policies aimed at the "New" High School. The authors present a historical assessment of Environmental Education laws and policies in both the Brazilian and global scenarios, exploring how this theme is approached in the midst of educational reforms and examining the recently implemented BNCC. The article concludes that the scenario of Environmental Education teaching in Brazil faces not only a lack of coherence, but also the possibility of loss of educational policies directed to this area. In the work of Corrêa, Ferri and Garcia (2022), the authors dive into the crucial moments of change in high school, contextualized by economic, social and cultural setbacks that gained prominence after the changes implemented in 2017. Also, according to these authors, at the beginning of the last century, reforms often prioritized the interests of the group with the highest purchasing power, resulting in a working class devoid of an appreciation of Higher Education. In recent years, however, with a new political orientation, Brazil has sought alternatives to democratize access and ensure the permanence of students in the educational system. The implementation of these actions marks a movement that solidifies a project of integral human formation, anchored in the integrated curricular approach.

4.6 Challenges and difficulties

Faced with the context of changes in Brazilian Basic Education, it is currently verified that discussions are taking place in favor of NEM, and it was thought with a project for another reality, since many of the state schools do not have the physical

structure to account for the methodological format for which this High School was idealized, and many spaces face poor structural conditions, lack of laboratories and precarious school feeding and transportation system (Ferretti, 2018). We do not have physical space or funds or investments for the implementation of training itineraries, many with proposals and shallow concreteness (Silva, 2018). The implementation of environmental education in NEM in Brazil has been facing several difficulties. One of the main barriers is that curriculum reform is limited in scope, resulting in varied interpretations by schools and modifying the initial proposal (Silva, 2018). Another existing difficulty that is observed is regarding the motivation of teachers "[...] due to working conditions, the lack of adequate infrastructures" (Tulio; Nagalli, 2023). To overcome these difficulties, it is important to integrate environmental issues with other disciplines, in an interdisciplinary work proposal, with History, Geography and Sciences (Oliveira; Neiman, 2020). This would help make Environmental Education more attractive and relevant to students.

The proposal brings changes in the curriculum, maintaining the common base, but reducing the number of classes of important subjects. The novelty is the choice of training itineraries by the student, and often the school cannot offer all or some of the itineraries, due to lack of physical structure, the number of students per class, the lack of trained teachers, that is, adequate conditions of supply and pedagogical quality (Ferretti, 2018). The public policy to support students to remain in school is also deficient, it does not cover the vast majority; in addition, dropouts are still occurring, as many students need to work to complement family income and are unable to reconcile study and work due to the time of the extended and/or expanded workload (Oliveira; Silva, 2023).

Other problems in Basic Education can be mentioned, such as the continuing education of teachers, which fell short of the training itineraries, and deepening paths offered, as well as salary issues (Baruffi, 2020). Regarding the issues of student education, we can say that there are still no significant advances, even with the changes in NEM. As for the approach to Environmental Education in high school curricula, it is observed that there is a reduction or absence of this subject (Frizzo; Carvalho, 2018). There are publications, however, in which the Director-General of UNESCO, Audrey Azoulay, during the World Conference in May 2021, declared that Environmental

Education should be a basic curricular component that, by 2025, should be present at all levels of education (UNESCO, 2021). According to Colagrande and Farias (2021), according to the notes presented by Unesco, it is essential to have new directions and perspectives for Environmental Education in the Brazilian school context. On the other hand, we, as Basic Education educators, need to constantly fight for spaces for discussions that deal with Environmental Education. We must be attentive so that the theme is present in school curricula, being reflected and brought to the day-to-day discussions of the classroom, otherwise it will increasingly fall asleep. If there are no discussions focused on the environment, humanity will hardly advance in the practices and actions to care for the preservation of the environment in which it is, as well as there will be no significant advances in the implementation of public policies for the common good.

5 Final considerations

Scientific production on NEM and Environmental Education has grown, with an emphasis on the critical approach. The research focuses on the Northeast, South and Southeast, especially in public universities, and there is gender balance between authors. Challenges persist, such as lack of structure, insufficient teacher training and limited public policies. The interdisciplinary integration of Environmental Education is seen as essential to train conscious citizens and face socio-environmental challenges.

6 References

ABAD, A.; ABAD, T. M. Análise de conteúdo na pesquisa qualitativa. *Alternativas Cubanas em Psicologia*, [*S. l.*], v. 10, n. 28, 2022. Available at: https://acupsi.org/wp-content/uploads/2022/03/03-Analisis-contenido-AAbad-TMarques.pdf A

ALMEIDA, J. S. *et al.* (org.). *Documento de área Ciências Ambientais*. Brasília, DF: MEC, 2019.

ARTAXO, P. As três emergências que nossa sociedade enfrenta: saúde, biodiversidade e mudanças climáticas. *Estudos Avançados*, São Paulo, v. 34, 2020. DOI: https://doi.org/10.1590/s0103-4014.2020.34100.005

BARDIN, L. *Análise de conteúdo*. Lisboa: 70, 1977.

BARUFFI, P. P. Desafios do Novo Ensino Médio: percepção de docentes de um projeto-piloto em uma escola de Santa Catarina. *In*: CONEDU, 8., 2020, João Pessoa. *Anais* [...]. João Pessoa: Conedu, 2020.

BRASIL. Constituição de 1988. Constituição da República Federativa do Brasil. *Diário Oficial [da] República Federativa do Brasil*, Poder Executivo, Brasília, DF, 5 out. 1988.

BRASIL. Emenda Constitucional nº 59, de 11 de novembro de 2009. Acrescenta § 3º ao art. 76 do Ato das Disposições Constitucionais Transitórias para reduzir, anualmente, a partir do exercício de 2009, o percentual da Desvinculação das Receitas da União incidente sobre os recursos destinados à manutenção e desenvolvimento do ensino de que trata o art. 212 da Constituição Federal, dá nova redação aos incisos I e VII do art. 208, de forma a prever a obrigatoriedade do ensino de quatro a dezessete anos e ampliar a abrangência dos programas suplementares para todas as etapas da educação básica, e dá nova redação ao § 4º do art. 211 e ao § 3º do art. 212 e ao caput do art. 214, com a inserção neste dispositivo de inciso VI. *Diário Oficial [da] República Federativa do Brasil*, Poder Executivo, Brasília, DF, 12 nov. 2009.

BRASIL. Lei nº 9.394, de 20 de dezembro de 1996. Estabelece as Diretrizes e Bases da Educação Nacional. *Diário Oficial [da] República Federativa do Brasil*, Poder Executivo, Brasília, DF, 21 dez. 1996.

BRASIL. Lei nº 10.172, de 9 de janeiro de 2001. Aprova o Plano Nacional de Educação e dá outras providências. *Diário Oficial [da] República Federativa do Brasil*, Poder Executivo, Brasília, DF, 11 jan. 2001.

BRASIL. Lei nº 13.005, de 25 junho de 2014. Aprova o Plano Nacional de Educação – PNE e dá outras providências. *Diário Oficial [da] República Federativa do Brasil*, Poder Executivo, Brasília, DF, 26 jun. 2014.

BRASIL. Lei nº 13.415, de 16 de fevereiro de 2017. Altera as Leis nºs 9.394, de 20 de dezembro de 1996, que estabelece as Diretrizes e Bases da Educação Nacional, e 11.494, de 20 de junho 2007, que regulamenta o Fundo de Manutenção e Desenvolvimento da Educação Básica e de Valorização dos Profissionais da Educação, a Consolidação das Leis do Trabalho - CLT, aprovada pelo Decreto-Lei nº 5.452, de 1º de maio de 1943, e o Decreto-Lei nº 236, de 28 de fevereiro de 1967; revoga a Lei nº 11.161, de 5 de agosto de 2005; e institui a Política de Fomento à Implementação de Escolas de Ensino Médio em Tempo Integral. *Diário Oficial [da] República Federativa do Brasil*, Poder Executivo, Brasília, DF, 17 fev. 2017.

BRASIL. *Parâmetros Curriculares Nacionais*: Ensino Médio. Brasília, DF: MEC, 1999.

BRASIL. Base Nacional Comum Curricular. Brasília, DF: Ministério da Educação, 2022. Disponível em: https://basenacionalcomum.mec.gov.br. Acesso em: 26 jul. 2025. *Diário Oficial [da] República Federativa do Brasil*, Poder Executivo, Brasília, DF, 17 fev. 2022.

BRASIL. Lei nº 12.796, de 4 de abril de 2013. Altera a Lei nº 9.394, de 20 de dezembro de 1996, que estabelece as diretrizes e bases da educação nacional, para dispor sobre a formação dos profissionais da educação e dar outras providências. Disponível em: https://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2013/Lei/L12796.htm. Acesso em: 26 jul. 2025. *Diário Oficial [da] República Federativa do Brasil*, Poder Executivo, Brasília, DF, 5 abr. 2013.

CANETTIERI, M. K.; PARANAHYBA, J. C. B.; SANTOS, S. V. Habilidades socioemocionais: da BNCC às salas de aula. *Educação & Formação*, Fortaleza, v. 6, n. 2, e4406, 2021. DOI: https://doi.org/10.25053/10.25053/redufor.v6i2.4406.

CARARO, E. R. *et al.* Environmental education in Brazil: Trends and gaps from 2015 to 2019. *Research, Society and Development*, [*S. l.*], v. 11, n. 4, 2022. DOI: https://doi.org/10.33448/rsd-v11i4.27598

CARDOZO, B. S.; QUEIROS, T. V.; DORNFELD, C. B. Educação Ambiental Crítica na Escola: referenciais teóricos e metodologias pedagógicas utilizadas no contexto brasileiro. *In*: CONEDU, 7., 2022, Goiânia. *Anais* [...]. Goiânia: UFG, 2022.

CARVALHO, C. P. F.; CAVALCANTI, F. O Novo Ensino Médio Paulista: velhas propostas de manutenção da dualidade estrutural e da precarização do ensino. *Educação & Formação*, Fortaleza, v. 7, e7317, 2022. DOI: https://doi.org/10.25053/10.25053/redufor.v7.e7317.

CARVALHO, L. M.; TOMAZELLO, M. G. C.; OLIVEIRA, H. T. Pesquisa em Educação Ambiental: panorama da produção brasileira e alguns de seus dilemas. *Caderno Cedes*, Campinas, v. 29, n. 77, p. 13-27, 2009. DOI: https://doi.org/10.1590/S0101-32622009000100002

CHIMELLO, V. F. *Diversidade metodológicas e temáticas nas principais revistas em educação ambiental brasileiras entre 2015 a 2019*. 2021. Monografia (Graduação em Ciências Biológicas) – Programa de Graduação da Universidade Comunitária da Região de Chapecó, Chapecó, 2021.

CHIMELLO, V. F.; CARARO, E. R.; BRITO, R.; REZENDE, R. S. Diversidade metodológicas e temáticas nas principais revistas em Educação Ambiental brasileiras entre 2015 à 2019. *Revista Tecnologia e Sociedade*, Curitiba, v. 19, n. 57, p. 1-20, 2021. DOI: https://doi.org/10.3895/rts.v19n57.15716

COLACIOS, D. R.; LOCASTRE, A. V. O Ensino Médio no Brasil: quais possíveis rumos? A ausência e o vácuo: Educação Ambiental e a Nova Lei do Ensino Médio brasileiro no século XXI. *Revista de Educação*, Campinas, v. 25, 2020. DOI: https://doi.org/10.24220/2318-0870v25e2020a4589

COLAGRANDE, E. A.; FARIAS, L. A. Apresentação – Educação Ambiental e o contexto escolar brasileiro: desafios presentes, reflexões permanentes. *Educar em Revista*, Curitiba, v. 37, 2021. DOI: https://doi.org/10.1590/0104-4060.81232

CORRÊA, S. S.; FERRI, C.; GARCIA, S. R. O. O que esperar do Novo Ensino Médio?. *Retratos da Escola*, Brasília, DF, v. 16, n. 34, p. 15-21, 2022. Available at: https://retratosdaescola.emnuvens.com.br/rde/article/view/1543 Accessed on: June 30, 2025.

FERREIRA, L. O.; AZEVEDO, N.; GUEDES, M.; CORTES, B. Institucionalização das ciências, sistema de gênero e produção científica no Brasil (1939-1969). *História, Ciências, Saúde*, Rio de Janeiro, v. 15, p. 43-71, 2008. DOI: https://doi.org/10.1590/S0104-59702008000500003

FERRETTI, C. J. A reforma do Ensino Médio e sua questionável concepção de qualidade da educação. *Ensino de Humanidades*, São Paulo, v. 32, n. 93, p. 25-42, 2018. DOI: https://doi.org/10.5935/0103-4014.20180028

FERRETTI, C. J.; SILVA, M. R. Reforma do Ensino Médio no contexto da Medida Provisória nº 746/2016: Estado, currículo e disputa por hegemonia. *Educação & Sociedade*, Campinas, v. 38, n. 139, p. 385-404, 2017. DOI: https://doi.org/10.1590/ES0101-73302017176607

FRIZZO, T. C. E.; CARVALHO, I. C. M. Políticas públicas atuais no Brasil: o silêncio da educação ambiental. *Revista Eletrônica do Mestrado em Educação Ambiental*, Rio Grande, n. 1, p. 115-127, 2018. DOI: https://doi.org/10.14295/remea.v0i1.8567

JACOBI, P. R.; GUERRA, A. F. S.; SULAIMAN, S. N.; NEPOMUCENO, T. Mudanças climáticas globais: a resposta da educação. *Revista Brasileira de Educação*, Rio de Janeiro, v. 16, n. 46, 2011. Available at: http://educa.fcc.org.br/scielo.php?script=sci_arttext&pid=S1413-24782011000100008&lng=pt&nrm=iso. Accessed on: June 30, 2025

KOEPSEL, E. C. N.; GARCIA, S. R. O.; CZERNISZ, E. C. S. A tríade da reforma do Ensino Médio brasileiro: Lei nº 13.415/2017, BNCC e DCNEM. *Educação em Revista*, Belo Horizonte, v. 36, 2020. DOI: http://dx.doi.org/10.1590/0102-4698222442

LAYRARGUES, P. P.; LIMA, G. F. C. As macrotendências político-pedagógicas da Educação Ambiental brasileira. *Ambiente e Sociedade*, São Paulo, v. 17, n. 1. p. 23-40, 2014. Available at: https://www.scielo.br/j/asoc/a/8FP6nynhjdZ4hYdqVFdYRtx/?fomat=pdf&lang=pt Accessed on: June 30, 2025.

LIMA, G. F. C. Educação Ambiental Crítica: do socioambientalismo às sociedades sustentáveis. *Educação e Pesquisa*, São Paulo, v. 35, n. 1, p. 145-163, 2009. DOI: https://doi.org/10.1590/S1517-97022009000100010

MACHADO, J. R. F. Metodologias de pesquisa: um diálogo quantitativo, qualitativo e quanti-qualitativo. *Revista Devir Educação*, Lavras, v. 7, n. 1, e-697, 2023. DOI: https://doi.org/10.30905/rde.v7i1.697

MELO, H. P.; OLIVEIRA, A. B. A produção científica brasileira no feminino. *Cadernos Pagu*, Campinas, v. 27, p. 301-331, 2006. Available at: https://estacio.periodicoscientificos.com.br/index.php/revistahorus/article/view/1598 Accessed on: June 30, 2025.

MENEZES, G. D. O.; MIRANDA, M. A. M. O lugar da Educação Ambiental na Nova Base Nacional Comum Curricular para o Ensino Médio. *Revista Educação Ambiental em Ação*, [*S. l.*], n. 75, 2021.

MESSIAS, E. R. Desequilíbrio ambiental e pensamento complexo: caminhos para o desenvolvimento sustentável. *Hórus*, Ourinhos, v. 18, n. 1, p. 1-21, 2023. Available at: https://estacio.periodicoscientificos.com.br/index.php/revistahorus/article/view/1598 Accessed on: June 30, 2025.

MINAYO, M. C. S. Análise qualitativa: teoria, passos e fidedignidade. *Ciência, Saúde Coletiva*, Rio de Janeiro, v. 17, n. 3, p. 621-626, 2012.

NOGUEIRA, C. Contribuições para a Educação Ambiental Crítica. *Revbea*, São Paulo, v. 18, n. 3, p. 156-171, 2023. Available at: https://periodicos.unifesp.br/index.php/revbea/article/download/14160/10433 Accessed on: June 30, 2025.

OCAMPO, D. M.; PERSICH, G. D. O.; FANFA, M. S.; TOLENTINO NETO, L. C. B. Diferentes perfis de estudantes brasileiros frente aos desafios ambientais: resultados de uma pesquisa em larga escala. *Educação em Foco*, Belo Horizonte, n. 65, 2018. Available at: http://www.revistaea.org/artigo.php?idartigo=3362 Acesso em: 30 jun. 2025.

OLIVEIRA, A. M.; SILVA, M. R. Implementação do Novo Ensino Médio no estado do Acre: a experiência das escolas-piloto. *Revista Espaço Pedagógico*, Passo Fundo, v. 30, 2023. DOI: https://doi.org/10.5335/rep.v30i0.14343

OLIVEIRA, L.; NEIMAN, Z. Educação Ambiental no âmbito escolar: análise do processo de elaboração e aprovação da base comum curricular (BNCC). *Revbea*, São Paulo, v. 15, n. 3, p. 36-52, 2020. Available at: https://scholar.archive.org/work/fxhivk2xznezxlhaddziwnjvva/access/wayback/https://periodicos.unifesp.br/index.php/revbea/article/download/10474/7735 Accessed on: June 30, 2025.

SANTA CATARINA (Estado). Secretaria de Estado da Educação. Diretrizes curriculares para o Ensino Médio: Itinerários Formativos. Florianópolis: SED/SC, 2021. Available at: https://www.sed.sc.gov.br. Accessed on: June 30, 2025.

SAUVÉ, L. Educação Ambiental: possibilidades e limitações. *Educação e Pesquisa*, São Paulo, v. 31, n. 2, p. 317-322, 2005. DOI: https://doi.org/10.1590/S1517-97022005000200012

SIDONE, O. J. G.; HADDAD, E. A.; MENA-CHALCO, J. P. A ciência nas regiões brasileiras: evolução da produção e das redes de colaboração científica. *TransInformação*, Campinas, v. 28, n. 1, p. 15-31, 2016. DOI: https://doi.org/10.1590/2318-08892016002800002

SILVA, M. A. A prática interdisciplinar dos docentes de Ciências na Educação Ambiental com alunos de Ensino Médio. *Research, Society and Development*, [*S. l.*], v. 11, n. 16, 2022. DOI: https://doi.org/10.33448/rsd-v11i16.38129

SILVA, D. N. S.; GOMES, E. T. A.; SERNA, A. G. Educação Ambiental no Novo Ensino Médio: o que há de 'novo'?. *Retratos da Escola*, Brasília, DF, v. 16, n. 34, p. 127-147, 2022. DOI: https://doi.org/10.22420/rde.v16i34.1466

SILVA, M. R. A BNCC da Reforma do Ensino Médio: o resgate de um empoeirado discurso. *Educação em Revista*, Belo Horizonte, v. 34, e214130, 2018. DOI: https://doi.org/10.1590/0102-4698214130

SILVEIRA, D. P.; LORENZETTI, L. Estado da arte sobre a Educação Ambiental Crítica no encontro pesquisa em Educação Ambiental. *Praxis & Saber*, Boyacá, v. 12, n. 28, p. 88-102, 2021. DOI: https://doi.org/10.19053/22160159.v12.n28.2021.11609

SOUZA, M. T.; SILVA, M. D.; CARVALHO, R. Revisão integrativa: o que é e como fazer. *Einstein*, São Paulo, v. 8, n. 1, p. 102-106, 2010. DOI: https://doi.org/10.1590/S1679-45082010RW1134

TULIO, L. D.; NAGALLI, A. Dificuldades na realização da Educação Ambiental nas instituições brasileiras de ensino básico. *Revbea*, São Paulo, v. 18, n. 4, p. 362-375, 2023. Available at: https://periodicos.unifesp.br/index.php/revbea/article/download/14774/10487 Acesso em: 26 jun. 2025.

UNESCO. Un*esco transforma Educação Ambiental em componente curricular básico até 2025*. Paris: Unesco, 2021.

ZANINI, A. M.; SANTOS, A. R.; MALICK, C. M.; OLIVEIRA, J. A.; ROCHA, M. B. Estudos de percepção e Educação Ambiental: um enfoque fenomenológico. *Ensaio*: Pesquisa em Educação e Ciências, Belo Horizonte, v. 23, e32604, 2021. DOI: https://doi.org/10.1590/1983-21172021230127 Accessed on: June 30, 2025.

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