

The relevance of bioethics knowledge for Brazilian basic education

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Abstract

This article investigates whether the bioethics guidelines are incorporated into basic education, as established by Article 23 of the *Universal Declaration on Bioethics and Human Rights*. This is a qualitative, descriptive, documentary research, the sources of which are the Brazilian National Curriculum Guidelines for Basic Education, the National Education Plan, and the National Common Curricular Base. The term “bioethics” is mentioned only once; however, the other bioethical guidelines are part of school culture. The results are analyzed from the perspective of complexity theory and bioethics.

Keywords: Bioethics. Education, primary and secondary. Social responsibility. Respect.

Resumo

Relevância dos conhecimentos da bioética para a educação básica brasileira

Neste artigo, investiga-se se os referenciais da bioética são contemplados na educação básica, conforme estabelece o artigo 23 da *Declaração universal sobre bioética e direitos humanos*. Trata-se de uma pesquisa de abordagem qualitativa, descritiva, documental, cujas fontes são as Diretrizes Curriculares Nacionais para a Educação Básica, o Plano Nacional de Educação e a Base Nacional Comum Curricular. O termo “bioética” é mencionado apenas uma vez, mas os outros referenciais bioéticos fazem parte da cultura escolar. Os resultados são analisados na perspectiva da teoria da complexidade e da bioética.

Palavras-chave: Bioética. Educação básica. Responsabilidade social. Respeito.

Resumen

Relevancia de los conocimientos de la bioética para la educación básica brasileña

En este artículo se investiga si los referentes de la bioética están contemplados en la educación básica, como establece el artículo 23 de la *Declaración universal sobre bioética y derechos humanos*. Se trata de una investigación de enfoque cualitativo, descriptivo y documental, cuyas fuentes son las Directrices Curriculares Nacionales para la Educación Básica, el Plan Nacional de Educación y la Base Nacional Común Curricular. El término “bioética” se menciona solo una vez, pero los otros referentes bioéticos forman parte de la cultura escolar. Los resultados se analizan desde la perspectiva de la teoría de la complejidad y de la bioética.

Palabras clave: Bioética. Educación primaria y secundaria. Responsabilidad social. Respeto.

The authors declare no conflict of interest.

The 20th century promoted experiments with human beings and natural resources, as well as an unprecedented intensification of scientific and technological production, which enabled disease control and increased both food production and global population's life expectancy. Despite this, worldwide inequalities in access to material goods, socioeconomic disparities, social exclusion, and the denial of political and civil rights persist. The 21st century has further complicated Techno-scientific advances in the biomedical field, genetic engineering and manipulation, transplantation, and the use of stem cells, among others, which have exacerbated ethical dilemmas related to equity and social justice, environmental preservation, rational use of natural resources, etc. In this context, in 2005, the United Nations Educational, Scientific and Cultural Organization (UNESCO) proclaimed the *Universal Declaration on Bioethics and Human Rights* (UDBHR)¹, establishing new international standards for ethical issues related to medicine, the life sciences, and associated technologies when applied to human beings, considering their social, legal, and environmental dimensions. Although the declaration does not have the force of law, Article 23 stipulates that the signatory States commit to bioethics education at all levels¹.

The term "bioethics" was first outlined in 1927 by Fritz Jahr in the article "Bioethik: Eine Umschau Über Die Ethischen Beziehung Des Menschen Zu Tier Und Pflanze," published in the German journal *Kosmos*, as *the respect for all living beings*². However, the term was forgotten until it was reintroduced in 1971 in the United States by oncologist Van Rensselaer Potter, who, in view of the fragility of ecosystems and the precariousness of human life on the planet, alerted to the need for a new form of knowledge, which he termed bioethics. Potter defined it as an interdisciplinary field and the *science of survival*³, positioning it—as a "bridge to the future"—between discoveries in the biological sciences and values from the human sciences. Bioethics did not resonate in that perspective but was incorporated as biomedical ethics.

No unequivocal concept of bioethics exists, thus the definition provided by UNESCO is adopted, which details that *bioethics is a systematic, pluralistic and interdisciplinary field of study involving the theoretical and practical moral issues*

*raised by medicine and life sciences as applied to human beings and humanity's relationship with the biosphere*⁴. Internationally, bioethics serves as a theoretical framework that encourages the analysis and discussion of moral dilemmas. In education, it is taught in higher education courses in the health field with the aim of contributing to the understanding and reflection on the persistent and emerging ethical issues that constitute the new challenges of the 21st century. Its commitment to education seeks human and social development by interrelating society, human life, and nature in the pursuit of understanding the complexity of life from inter- and transdisciplinary perspectives.

This research is positioned at the interface between bioethics and education and investigates whether bioethics as a field of knowledge is prescribed in the guiding documents for Brazilian high school education and whether, as prescribed by Article 23 of the UDBHR, bioethical guidelines are constitutive elements of school culture. This is a qualitative research study employing documentary analysis, the sources of which are the Brazilian National Curriculum Guidelines for Basic Education (DCNEB)⁵, the National Common Curricular Base (BNCC)⁶, and the National Education Plan (PNE)⁷ for the 2014-2024 decade. The delineation of bioethical guidelines is based on the UDBHR¹ and the theory of bioethical guidelines⁸. The quantitative results serve as a reference for content analysis⁹. The documentary corpus is analyzed from the perspective of bioethics based on Potter¹⁰, Pessini and Barchifontaine¹¹, Hossne^{8,12}, and complexity theory¹³⁻¹⁷.

Bioethics and Education

In 2005, UNESCO approved the UDBHR. Article 19 highlights the importance of promoting debate, education, and raising public awareness and mobilization in bioethics, whereas Article 23 calls for bioethics education at all levels of instruction¹. For the first time in history, bioethics was recognized as a human right.

Currently, bioethics is taught in both undergraduate and graduate programs, preparing healthcare professionals in ethical conduct^{18,19}. Bioethics education can empower citizens with critical and reflective autonomy, enabling them to become active participants in ethical dilemmas (...) in

*pursuit of a just, egalitarian, and sustainable society*²⁰. It contributes to the discussion, reflection, and understanding of the ethical dilemmas that persist in the 21st century; however, its implementation as a human right depends on educational public policies that prioritize the development of ethical individuals capable of addressing social and environmental challenges.

Bioethics is concerned with both current and future generations; thus, the future horizon in education is also informed by the theoretical analysis of Morin's complex thought¹³⁻¹⁷. The theory of bioethical guidelines^{8,12,21} brings the bioethical discussion closer to social, environmental, human rights, and coexistence issues. The guidelines proposed by this theory extend beyond the principles of medical bioethics⁸ to encompass rights, duties, and ethical commitments, integrating the biological, human, and exact sciences with society.

In this research, the following guidelines were delineated due to their interface between the principles of bioethics and the theory of complex thought¹³⁻¹⁷: social responsibility; interdisciplinarity/transdisciplinarity; respect; and care. It is necessary to conceptualize these benchmarks specifically within the contexts of education and bioethics—understood as wisdom, the science of survival, or a bridge between technological knowledge and the humanities. This field represents knowledge aimed at using learning for the benefit of society²², a domain to develop and act inter- and transdisciplinarily in education, addressing topics related to human dignity, respect for diversity, the environment, and social relationships among human beings and with nature^{14,22-24}. Aligning the perspectives of Fritz Jahr and Van R. Potter, Renk, Guebert, and Enns conclude that these two foundational figures in bioethics engage in an *interdisciplinary dialogue for a Bioethics that respects cultural differences, teaches responsible action for global citizenship, seeks new forms of solidarity to protect life on Earth, and expresses concern for the future of humanity*²⁵.

According to Edgar Morin, *responsibility is an ethical humanistic concept that only gains meaning for the conscious subject*²⁶. Responsibility toward all living beings and the environment, including future generations, shifts the perspective from human dominion over other living beings and natural resources^{23,25}.

Respect, the act of honoring others, encompasses human diversity, solidarity, vulnerability, autonomy, social relationships, and the relationship with nature. For bioethics, *respect for human life is fundamental*²⁷. Respect involves tolerance, which is the capacity to endure the expression of different ideas; it does not mean endorsing what is despicable or repulsive, but rather discerning what should be given a voice and what should not²³.

Within school culture, care is manifested in coexistence and interaction rather than intervention. It is via care that the possibility of a *loving, respectful, and non-aggressive relationship with reality is established, thus being non-destructive*²⁸. Care possesses an *ontological dimension that is intrinsic to human existence*²⁹. In bioethics, care stems from the *ethics of care* [, which] *values interpersonal relationships—human interconnection and interdependence—as one of the most precious aspects of daily life, especially in health care*³⁰.

Interdisciplinarity, a fundamental characteristic of bioethics^{31,32}, is also embedded as a prerequisite in the documents governing basic education. Potter² who described bioethics as interdisciplinary ethics, defined interdisciplinarity as the interaction among science, technology, and the humanities. *Interdisciplinarity is a hallmark of bioethics*³³, particularly in its educational aspect. Complementing interdisciplinarity is transdisciplinarity, which emerges from the former by transcending the boundaries of disciplines, employing concepts and techniques that emphasize dialogue and foster exchange and cooperation³⁴.

Interconnecting knowledges

Challenges for education and bioethics

In the theory of complex thought, value is placed on that which connects an object to its context, whether it is a fact, an element, a piece of information, or data¹⁵. It presents reconnection as a permanent cognitive principle and presupposes a dialectic—the dialogic—that links contradictions and thus embodies a conflict between the aspiration to totality and the impossibility of totality.

Potter³ and Morin¹⁶, despite the temporal distance between their writings, converge theoretically regarding the finitude of humanity, the emergence of collective consciousness, the interdependence between human beings and nature, and concern for the future²³. Within this perspective, education can promote the relationship between the natural sciences, the human sciences, the humanities, and philosophy with the human condition¹². Humanistic culture is generic and faces great human interrogations, whereas scientific culture separates areas of knowledge in a way that, despite admirable discoveries, no reflections on human destiny are fostered¹⁴. The education of the future requires existing knowledge but must overcome the fragmentations resulting from specialization¹⁶. In the early years of schooling, education separates, isolates, and dissociates objects, disciplines, and issues, leading to a partial interpretation of reality. In light of this, Morin suggests understanding complexity as a challenge to knowledge, not a solution¹⁵.

To overcome the compartmentalization of knowledge, Brazilian basic education must become more interdisciplinary and transdisciplinary in its methodology. The difficulty of interconnecting knowledge lies in its control by principles and paradigms that create a dissociation between subject and object^{13,16}. The absence of an education with an inter- and transdisciplinary perspective weakens the global perception of society and citizenship. Simply accumulating knowledges does not prepare students to face and solve issues¹³, as it is necessary to connect knowledge to contexts and meanings.

The convergences between Edgar Morin's complex thought and bioethics can provide *bridges to the future through their commitment to life*³⁵, envisioning an education that seeks to interconnect knowledges in an interdisciplinary manner and to establish the interdependence of different sciences for the understanding of the human being, society, and nature³⁶.

Method

This is a qualitative, descriptive research with a documentary research procedure^{37,38}. The methodology of content analysis guides the research

stages⁹. The research sources are the guiding documents of Brazilian basic education: the National Curriculum Guidelines for Basic Education (DCNEB), which establish the mandatory curricular basis for all basic education networks (the BNCC is a document that supplants the DCNEB, but this document was also considered as it was prepared after the UDBHR); the National Education Plan (PNE2014–2024), which establishes the decennial goals to be achieved in educational policies; and the BNCC, which standardizes the curriculum by specifying the contents, objectives, and competencies to be achieved by students^{5–7}. Each document was developed within specific social, political, and cultural contexts, reflecting the social and ethical debates in progress and showing the advances, continuities, and changes in school knowledges.

In the research process, the educational guidelines produced after 2005 were initially selected: the Law of Guidelines and Bases of Education (LDB)³⁹, although it presents important references for educational guidelines, dates from 1996—prior to the UDBHR—and does not address bioethics; hence, it was not included in the research.

The search references were defined based on the theory of bioethics guidelines⁸ and the UDBHR¹ and are as follows: social responsibility; respect; care; and inter-/transdisciplinarity. In the systematic reading of each source, an effort was made to locate and understand the knowledges and ethical principles present. The investigation of these references was conducted in the source documents, including the number of citations and the meanings attributed to each reference by document.

The numerical results were organized in tables, and the meanings attributed to each researched reference were categorized. The theoretical contributions on bioethics, education, and complexity theory are used in the analysis of the research results, which should indicate whether Article 23 of the UDBHR is a human right guaranteed to students.

Results and discussion

The research results are presented as tables and graphs. Table 1 shows the total research results.

Table 1. Number of citations of the references per document

Descriptor/reference	PNE	BNCC	DCNEB
Bioethics	0	1	0
Social responsibility	0	3	2
Respect	2	37	143
Care	0	51	69
Inter-/transdisciplinarity	1	22	92

PNE: National Education Plan; BNCC: National Common Curricular Base; DCNEB: National Curriculum Guidelines for Basic Education

Table 1 shows that in the BNCC there is only one citation to bioethics—not as content, but as information regarding the document's preparation. A prevalence of the reference "respect" was found, whereas interdisciplinarity, care, and social responsibility appeared in smaller numbers. The mentions of the references are more numerous in the DCNEB and the BNCC, which are content-guiding documents, and less numerous in the PNE, which is a plan of future actions. Next, each reference is individually explored and analyzed with theoretical interpositions between the citations in the documents and the theoretical contributions.

Bioethical reference

The bioethical reference was examined to determine whether this area of knowledge is part of school culture. We found only one citation in the BNCC—in the acknowledgments to the researchers who prepared the critical reviews on issues related to diversity and human rights⁶. This result shows that bioethics education is not guaranteed as a human right (Article 23 of the UDBHR). It can be inferred that both bioethics and the UDBHR are either unknown or unrecognized by national education administrators, and that public policies are needed to ensure their implementation.

How can we expect that complex social, environmental, and health issues—which involve ethical dilemmas—will be discussed and understood by young students if they are not taught in schools? How can we expect students to reflect on complex and persistent ethical issues that are part of their everyday life if the UDBHR is not a subject of analysis in basic education? This result reveals a gap between research and studies in the

field of bioethics and its inclusion in the guiding documents of Brazilian basic education.

Social responsibility reference

Social responsibility is mentioned five times in the documents analyzed, with three occurrences in the BNCC and two in the DCNEB (none in the PNE; Table 1). This result is not significant because topics related to responsibility are not detailed in the documents analyzed. In the DCNEB⁵, social responsibility holds the meaning of an educational principle and refers to individuals committed to the quality of education. In the BNCC⁶, it is related to citizenship formation: it is an objective to be achieved via cognitive and cultural development, for the exercise of citizenship and entry into the labor market.

Social responsibility is understood as a humanistic and ethical notion that can only manifest with the development of consciousness for it²⁹. Bioethics seeks to foster a society more aware of its responsibilities toward human survival and social well-being³—an objective also found in basic education according to the DCNEB and the BNCC.

Respect reference

The reference to respect relates to otherness, considering the other's point of view, and the recognition of others¹². Tolerance—being open to ideas different from one's own and allowing the expression of diversity—is also connected to respect¹⁷. In this documentary research, respect was defined as accepting differences and treating others with consideration. The search included the variables "*desrespeito*" (disrespect) and "*respeitoso(a)*" (respectful).

A total of 182 mentions were recorded (see Table 1); in one of the citations in the DCNEB, respect is considered as the welcoming of everyone⁵. The meanings attributed in these documents align with a condition of bioethics—namely, the absence of prejudice, the humility to *respect* the other's viewpoint (otherness), or the recognition that one must change one's own perspective when confronted with a mistake¹².

Given the multiplicity of meanings attributed to the term in the documentary sources, it was divided into categories (Table 2).

Table 2. Meanings attributed to the respect reference

Descriptor category - respect	PNE	BNCC	DCNEB
A – Respect for diversity and differences (ethnicity, culture, religion, schooling level, mindset, political preference)	2	23	65
B – Respect for others, for the common good, for inclusion, for affective bonds	0	12	25
C – Respect for the environment	1	3	11
D – Respect for general and human rights	1	1	27
E – Respect for access to knowledge	0	1	1
F – Respect for social and cultural values	0	1	5
G – Respect for freedom	0	0	4
H – Respect for democratic order	0	0	9
I – Respect for human dignity	0	0	8
J – Respect for older adults	0	0	2

PNE: National Education Plan; BNCC: National Common Curricular Base; DCNEB: National Curriculum Guidelines for Basic Education

In Table 2, it is observed that respect is less mentioned in the PNE and appears more frequently in the DCNEB, followed by the BNCC. Most of the mentions relate to diversity, such as respect for others and human rights (categories A, B, and D).

The BNCC highlights educational laws and respect for cultural, social, and environmental diversity, a topic already mandatory in education according to Law 9,475/1997⁴⁰—respect for Brazil's cultural and religious diversity. Additionally, Law 11,645/2008⁴¹ includes in the curriculum the mandatory teaching of Afro-Brazilian and Indigenous history and culture; Law 9,795/1999⁴² establishes the National Environmental Education Policy; Law 10,741/2003⁴³ addresses the Statute of the Older Adult; and Decree 6,949/2009⁴⁴ promulgates the International Convention on the Rights of Persons with Disabilities⁶.

Moreover, in the BNCC, respect for diversity and/or differences, although largely addressed in generic terms, is given a specific focus in some citations—for example, when addressing the development of themes related to religious culture: constructing meanings, experiences, and attitudes of valuing and respecting religious cultural diversity, based on the problematization of the relationships between religious knowledge and power in society⁶.

The DCNEB also address respect for differences in physical condition, origin, gender, social class, and sociocultural context as a socioeducational,

artistic, cultural, and environmental foundation⁵. Regarding respect for the environment, the guidelines propose that basic education provide an environment conducive to strengthening the appreciation of nature—respecting all forms of life, caring for living beings, and preserving natural resources—as well as developing sustainable policies to reverse environmental resource depletion⁵.

Regarding human rights, respect is highlighted in the DCNEB, which cite the United Nations (UN) and state that school is the ideal place to develop respect that leads to the guarantee of human rights. Human rights are a guiding principle in basic education and aim to promote better human coexistence⁵.

The teaching of social and cultural values is also associated with respect and, in the DCNEB, occasionally appears in the objectives of certain subjects, such as geography, aiming at *developing social values such as respect, tolerance, solidarity, self-care, and care for others, as well as fostering citizen protagonism*⁴⁵. The document establishes that cultural values must be respected and, more specifically, that the right to the valorization of different cultures and ethnic groups—such as *quilombola* and Indigenous populations—must be ensured⁵.

Respect for freedom and democratic order is mentioned 15 times in the documents analyzed when addressing the fundamental values of education. In the DCNEB, these values

are grounded in good coexistence, the right to citizenship, and respect for democratic order⁵.

The subject is also mentioned towards human dignity, access to knowledge, and older adults. Moreover, respect for the dignity of the child as a human being must be guaranteed along with its protection against any form of violence or neglect; that respect for ethnic diversity and Indigenous educational knowledges is assured by the right to use native languages and Indigenous learning processes; and that Black people, their African descent, culture, struggles, and history must be valued and respected⁵.

Respect for older adults, as mentioned, refers to the need to understand the aging process in order to eliminate prejudice⁵. Respect for life is part of the guidelines for basic education and *must be deeply internalized by the individual, continuously guiding them, enabling self-organization, and fostering the perception of oneself as part of the web of life*⁴⁶. Education can thus promote the integral formation of the individual, foster dialogue among disciplines, reconnect knowledges, and support civic learning.

Both the DCNEB and the BNCC cite respect as a fundamental right that can only be considered in association with plurality and diversity—nationality, ethnicity, gender, social class, culture, belief, sexual orientation, and political preference^{5,6}. Other meanings of the respect reference are directed towards the environment, human rights, access to knowledge, values, freedom, democratic order, human dignity, and the older adult. These categories (C to J in Table 3) total 75 citations in the documents analyzed.

The DCNEB address respect in a more comprehensive and emphatic manner compared to the other sources, especially the BNCC, which was developed later. In any case, the meanings attributed to the respect reference in the documents analyzed at its interface with bioethics indicate that it serves as a reference bridge for bioethical reflection³. They articulate with the concept of bioethics for life, according to which the transmission of values in a dynamic sense of inter- and transgenerational solidarity³⁰ can strengthen the sense of respect and human dignity.

Care reference

Care is part of school culture and relates to other bioethical references such as dignity,

non-maleficence, solidarity, quality of life, and serenity⁸. Care is mentioned 123 times in the DCNEB and the BNCC—in both the content and the objectives—and not at all in the PNE. Table 3 presents the meanings attributed to care.

Table 3. Meanings attributed to the care reference

Descriptor category – care	PNE	BNCC	DCNEB
A – Care as an educational principle, a right	0	4	12
B – Care in the educational process: to value, adapt, respect, support	0	4	16
C – Different forms of care: culture, religions, social groups	0	1	11
D – Family care	0	0	6
E – Care for the environment and animals	0	8	16
F – Personal care (of oneself and others), health, of life	0	37	8

PNE: National Education Plan; BNCC: National Common Curricular Base; DCNEB: National Curriculum Guidelines for Basic Education

In the DCNEB, care—understood as welcoming with respect and attention for all—is an educational principle of basic education. In early childhood education, care is a foundational principle in the process. Its importance is highlighted as a principle for basic education in the initial and continuing education of teachers. Care is related to coexistence, education, experience, value, and conduct within the school and social environment. The DCNEB emphasize the value of care in education as it relates to collective coexistence⁵.

In the BNCC, care is relevant in the educational process, aiming at the student's physical, cultural, affective, and ethical development, including areas such as sexuality, health, well-being, and leisure. Care for the environment and living beings is linked to life and human dignity on local, regional, and global scales. It is addressed in a manner that encourages the development of self-care, care for others, and care for the planet⁶, aligning with the statements of Potter¹⁰ and Morin⁴⁷. In early childhood education, it is recommended that children have the opportunity to share situations of caring for plants and animals at school⁶. In the BNCC, the importance of valuing coexistence

includes political-citizenship practices, which are related to the exercise of citizenship, respect, responsibilities, and modes of intervention in social and political issues. The value of human coexistence in the family, at work, in social movements, and in social organizations is also present in the Law of Guidelines and Bases of National Education⁴⁰.

In bioethics, care is grounded in the “ethics of care,” *whose commitment mobilizes us toward a radical responsibility for the promotion of the individual, respecting and fostering their autonomy, citizenship, dignity, and health*⁴⁸. It also values interpersonal relationships, human interconnection, and interdependencies to promote coexistence via interaction³¹. Bioethics, as a bridge to a future³ with better coexistence and interaction, uses care as a reference, so that it can contribute to the development of a humanized education concerned with all life, both in the present and in the future.

Inter-/transdisciplinarity reference

Interdisciplinarity and transdisciplinarity were investigated as a single category, as they represent approaches to addressing topics that may serve as an educational proposal for all levels and content areas⁴⁹. An interdisciplinary attitude is one of dialogue—a stance that, when faced with alternatives, seeks to know more and better, with *humility regarding the limits of one's own knowledge*⁵⁰. Transdisciplinarity occurs via the overcoming of disciplinary boundaries using techniques that emphasize dialogue, thus fostering exchange and cooperation¹³.

Interdisciplinarity/transdisciplinarity is mentioned 92 times in the DCNEB, 22 times in the BNCC, and there is one citation in the PNE, totaling 115 mentions. In the DCNEB, the importance of interdisciplinarity for education is situated within the discipline, whereas transdisciplinarity extends beyond the disciplines and involves the transfer of methods from one discipline to another with the aim of understanding the contemporary world⁵¹.

This is the realm of bioethics: it is not a discipline but rather the wisdom of seeking unity of knowledge across the various fields of life. Morin^{15-17,48}, when developing the theory of complex thinking, argues that interdisciplinarity

and transdisciplinarity are foundations for a potential advancement and understanding of humanity. It is necessary to overcome in education the model in which *each discipline first seeks to assert its territorial sovereignty (...) and where boundaries are confirmed instead of collapsing* (our translation)⁵². To achieve this, it is necessary to develop interdisciplinarity and move toward transdisciplinarity, permeating the curriculum and the dialogue among knowledges.

When addressing modernization—which includes discussions about the influence of new technologies on the health and well-being of society—the BNCC indicates that the discussion about modernization processes is characterized by interdisciplinary dialogue. Indicating that interdisciplinarity must advance toward transdisciplinarity, the DCNEB conclude that it is necessary to go beyond the mere juxtaposition of curricular components and to relate them to studies, research, and action⁶.

Bioethics in basic education can develop by overcoming the compartmentalization of knowledges via their articulation and contextualization¹³. The advancement of knowledge and the role of bioethics in the study and practice of different areas occur when interdisciplinarity and transdisciplinarity are cultivated in a way that forms students with a global worldview, that is, capable of articulating and contextualizing knowledge¹⁴.

Despite the 115 citations, interdisciplinarity and transdisciplinarity seem to be more present in the guiding documents than in school practice. In the *curricular guidelines for teacher education and pedagogy, there remains a tradition of a disciplinary focus, and the curricular structure for teacher training is fragmented and lacks integrated disciplines*⁵³. This analysis shows that basic education teachers are neither guided nor encouraged toward inter-/transdisciplinarity, which is fundamental for the development of bioethical knowledges in schools. Therefore, they do not know bioethics, which, through ethical evaluation, can present solutions to moral dilemmas.

The research results demonstrate that, even though the right to bioethics education exists, it is not guaranteed in Brazil due to the lack of public policies. Bioethics is still not a knowledge area present in basic education, which restricts the formation of individuals capable of dealing

with complex and challenging ethical situations resulting from the advances in biotechnological and humanistic sciences. The presence of other bioethical references in the guiding documents of basic education indicates that young people are prepared to respect diversity and human rights and to engage in citizenship formation; and that they are only partially prepared to face persistent and emerging ethical situations that require interdisciplinary knowledges. Therefore, the existence of the UDBHR does not mean that the human rights prescribed therein are assured. The concerns for the future of humanity that Potter presented in the 1970s, as well as the education of the future proposed by Morin, still require a form of knowledge that goes beyond disciplinary boundaries and is both trans- and interdisciplinary.

Final considerations

The research results show that bioethics as a field of knowledge, as proposed by Potter in the 1970s, is still not part of school culture. However, the bioethical references outlined in the UDBHR are present in the educational documents analyzed, incorporated as school content. Therefore, these documents ensure the ethical formation of young people, with a view toward respect for social, cultural, and environmental diversity and the exercise of care, thereby preparing them to exercise citizenship and social responsibility. Educational policies must indicate a position regarding the training of students and teachers in bioethics, as established in the UDBHR, and guarantee their commitment to human rights, the overcoming of inequalities, social inclusion, and the construction of a more democratic and equitable society.

The implementation of bioethics education and training can contribute to the formation of ethical, reflective individuals by creating and developing a space for interdisciplinary dialogue in which different areas of knowledge interact. It can be a new wisdom, based on respect for dignity and human rights. The teaching of bioethics contributes to the strengthening of both fields, with the perspective of forming individuals capable of confronting ethical issues arising from the complex advances in science and technology, and of fighting for the realization of democracy, rights, and human dignity.

The guarantee of the human right to bioethics education still requires public policies for its implementation in Brazil, as proposed in Article 23 of the UDBHR. The incorporation of bioethics in basic education can develop via specific themes, transversal themes, preferably from an inter- and transdisciplinary perspective. In this way, young people would be prepared to discuss and confront persistent and emerging social issues, as well as the impacts on daily life caused by technological advances, while also prompting them to rethink the human condition and their responsibilities toward the future of humanity.

The meeting of Potter, the bioethicist, and Edgar Morin, the educator, presents points of convergence for the education of the future and for the future of coming generations. Both authors envision the importance of education in shaping students who are prepared to face the challenges ahead. The research shows numerous points of convergence and interfaces between the proposals of both authors, such as the need to overcome disciplinary compartmentalization, the ethical formation on a global scale, and the rethinking of the human condition. It also indicates that the future, although uncertain, requires ethical, committed citizens who respect diversity, exercise care for themselves and others, and have human dignity as the foundation of life.

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Cristoph Enns and Valquíria Elita Renk designed the research project. Cristoph Enns collected and analyzed the data. Both authors wrote the article.

Responsible editor – Dilza Teresinha Ambrós Ribeiro

Received: 7.11.2024

Revised: 1.3.2025

Approved: 1.29.2025