



Educating for Biocultural Diversity and Sustainable Development in First Years of Schooling: An Analysis of Documents From the Portuguese Educational System

Bruna Fonseca Batista and Ana Isabel Andrade*

CIDTFF—Research Centre on Didactics and Technology in Education of Trainers, Department of Education and Psychology, University of Aveiro, Aveiro, Portugal

OPEN ACCESS

Edited by:

António Valter Chisingui,
Instituto Superior de Ciências da
Educação da Huíla, Angola

Reviewed by:

Luis Poza,
San Jose State University,
United States
Isabel Menezes,
University of Porto, Portugal

*Correspondence:

Bruna Fonseca Batista
brunabatista@ua.pt

Specialty section:

This article was submitted to
Language, Culture and Diversity,
a section of the journal
Frontiers in Education

Received: 11 January 2021

Accepted: 19 July 2021

Published: 03 September 2021

Citation:

Batista BF and Andrade AI (2021)
Educating for Biocultural Diversity and
Sustainable Development in First Years
of Schooling: An Analysis of
Documents From the Portuguese
Educational System.
Front. Educ. 6:652196.
doi: 10.3389/feduc.2021.652196

Educating for sustainable development can encompass different perspectives and possibilities that enable the achievement of the goals of (more) sustainable development, as predicted by the United Nations for 2030. This type of education also involves a humanist and citizenship education, which can prepare children, youth, and adults to face current and future challenges, local and global, as actors in building a better future. We believe, however, that for education to bear fruit, it is important that children, from the first years of schooling (primary education), can be in contact with different perspectives, people, ways of learning, and worldviews, locally contextualized and relevant, with strong links to the natural and social environment involving their communities, such as education must value linguistic and cultural diversity, without forgetting biodiversity and the influences they exert on the education of individuals. Thus, looking at an education that encompasses the relationships among linguistic, cultural (stories, celebrations, heritage, artefacts, relationships, and behaviors between people, etc.), and biological diversity, the present study aimed to understand how biocultural diversity is present in the main normative-legal documents that govern education for the first years of schooling in the Portuguese educational system and, above all, if its existence is considered in education for sustainable development. For this study, seven guiding documents of the Portuguese educational system, and primary education in particular (education that includes the interval from the 1st to the 4th year and the average age-groups of 5–10 years of age), were analyzed, and the results show a gap regarding the presence of biocultural diversity, which points to an incomplete perspective of education for sustainable development, forgetting languages, cultures, and individuals.

Keywords: education for biocultural diversity, education for sustainable development, first years of schooling, elementary education, Portuguese educational system, sustainable development goals

INTRODUCTION

Several decades ago, the concept of sustainable development began to emerge in political discourse in a clear attempt to safeguard the human species and the planet. The landmark for its conceptualization and urgency lies in the presentation of the Report of the World Commission on Environment and Development, better known as the Brundtland Report or *Our Common Future* (World Commission on Environment and Development 1987), in the 1980s. After studying the impacts of human activity on the natural and social environment, the concept of sustainable development becomes an integral part of our daily lives, whether due to local and global, economic, social, political, and/or cultural issues. The perspective associated with the initial image of the concept, published in 1987, is refuted by several authors since it can be understood as an anthropocentric conception, insofar as there is a clear concern with better resource management so that it continues with levels of productivity and consumption hitherto identified as an economic response to capitalist happiness (Boff 1990; Redclift 2018). Thus, the authors broaden our discourse to the common future not only of the human species but also of all other species, their ecosystems, and their habitats so that we stop seeing them as resources and start understanding them as fundamental elements to life on Earth, without which the world as we see it today would cease to exist.

Sustainable Development and Education

Education, from an early age, is considered a fundamental field for sustainable development, as can be seen in Chapter 36 of Agenda 21 (United Nations 1995). Here, education is understood as a process for the development of human beings and societies, being important for the promotion of environmental ethics and conscience, with a focus on values, attitudes, capacities, and behaviors. Albeit implicitly, the importance of biocultural diversity is already mentioned, by pointing out that formal education includes dynamics related to the physical,

socioeconomic, and human development environments. Later, with the United Nations Decade of Education for Sustainable Development, between 2005 and 2014, the role played by education as a fundamental factor for sustainable development is also highlighted. Education was now to be understood as a vital action that allows everyone to benefit from education and learning oriented toward sustainable values, behaviors, and ways of life through the transformation of society (United Nations Educational Scientific and Cultural Organization 2005). Education for sustainable development is thus understood as an approach to achieve what were the millennium goals, now reformulated and extended as the sustainable development goals, in the 2030 Agenda, which are expected to be achieved by 2030 (United Nations 2015).

The 2030 Agenda has the main objective of eradicating poverty and was adopted at the United Nations Sustainable Internal Summit, which took place in 2015 at the time of the United Nations General Assembly. Thus, the 17 sustainable development goals (Table 1) and 169 targets in view, in force since January 1 2016, are expected to minimize the impact of human beings in the economic, social, and environmental spheres, at the same time that they underscore the value of human rights and related issues such as gender equality and women and children empowerment.

The 2030 agenda also calls for a broader vision of sustainable development, defending the importance of promoting the well-being of all species. At the same time, it calls for an educational work that will promote an intervention in society that allows a response to the emerging challenges of the 21st century, promoting more sustainable lifestyles, global citizenship, gender equality, and valuing cultural diversity for more sustainable development.

This way, it is expected that, from the first years of schooling, children will develop specific and transversal competences that allow their development, individually, and collectively, as citizens of a world that demands constant learning from and about others and the world. The document containing the Agenda was

TABLE 1 | Sustainable development goals.

Goal 1. End poverty in all its forms everywhere
Goal 2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
Goal 3. Ensure healthy lives and promote well-being for all at all ages
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5. Achieve gender equality and empower all women and girls
Goal 6. Ensure availability and sustainable management of water and sanitation for all
Goal 7. Ensure access to affordable, reliable, sustainable, and modern energy for all
Goal 8. Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation
Goal 10. Reduce inequality within and among countries
Goal 11. Make cities and human settlements inclusive, safe, resilient, and sustainable
Goal 12. Ensure sustainable consumption and production patterns
Goal 13. Take urgent action to combat climate change and its impacts
Goal 14. Conserve and sustainably use the oceans, seas, and marine resources for sustainable development
Goal 15. Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels
Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

recognized and signed by the 193 countries that make up the United Nations Organization, representing a commitment to, by 2030, respond to the challenges that are faced by the society, with the intention of promoting joint action by the various signatory states.

Focusing on the SDGs in the Portuguese context and what has been done in response to this political commitment, the Ministry of Foreign Affairs report of 2017 indicates, as national strategic priority, the implementation of the 2030 Agenda. According to the report, the implementation should be comprehensive (with the intention of working on all SDGs), integrated (based on a global and interrelated view of all SDGs), and focused (through identifying priority SDGs in the strategic vision for national development) (Ministério dos Negócios Estrangeiros 2017). As priority goals, the report refers to the achievement of the following SDGs: SDG 4—*Quality education*; SDG 5—*Gender equality*; SDG 9—*Industry, innovation, and infrastructure*; SDG 10—*Reduced inequalities*; SDG 13—*Climate action*; and SDG 14—*Life below water*. Education is mentioned in this report as being of central importance, and action at the educational level is expected to reverse historical inequalities and exclusions, with direct impacts at the level of personal and social well-being, economic performance, and care for society and the environment. These impacts are connected to the level of equality and social cohesion in the fight against poverty, which is the major goal to be achieved by 2030—poverty eradication. In 2020, the Portuguese National Statistical Institute also produced a report based on indicators for Portugal with data between 2010 and 2019 (Instituto Nacional de Estatística 2020). Through this analysis, it was possible to understand that 68 of the 129 indicators that could be analyzed in the Portuguese context have evolved positively. Of the remaining indicators, 30 showed an unfavorable evolution and three showed no change at all.

Biocultural Diversity

In light of the above, it seems important for us to understand not only the impacts of human actions at different dimensions (e.g., social, cultural, economic, and environmental) but also the relationships that exist between those levels. Thus, when educating for sustainable development, it is important to promote an education that considers the development of an individual and collective awareness that respects and cares for biological, linguistic, and cultural diversity, considering the relations that exist between them and their importance for the resilience of the ecosystems. This is what we call biocultural diversity, the inextricable link between these diversities promoting the use of resources in an environmentally balanced way, respecting species, languages, and cultures as different heritage of humanity. With the loss of consciousness associated with the interdependence of human relations with the natural and social environment, human beings lose part of their linguistic and cultural diversity, namely, through the imposition of dominant languages and ways of living on more fragile populations, often through formal education (Maffi 2001; Poole 2018).

In this sense of valuing and respecting diversity, the concept of biocultural diversity emerges as a perspective that understands

biological diversity, linguistic diversity, and cultural diversity as connected, interdependent, and coevolutionary (Maffi 2001; Skutnabb-Kangas, Maffi, and Harmon 2003; Maffi 2012; Raygorodetsky 2014; Loh and Harmon 2014; Toledo, Barrera-Bassols, and Boege 2019). This concept is based on the same pillars as education for sustainable development, calling for understanding the relationship between human beings and the environment, overcoming a vision that, until now, has been considered anthropocentric (Skutnabb-Kangas, Maffi, and Harmon 2003; Maffi 2012; Merçon et al., 2019; Sterling et al., 2017). We believe that it is from the interaction among the environment, cultures, and languages that we can awaken “la curiosidad sobre quiénes somos y de donde venimos, y promovemos el debate sobre las maneras de preservar y desarrollar nuestro carácter único” (Skutnabb-Kangas, Maffi, and Harmon 2003, 6) and our world. As also stated by Skutnabb-Kangas, Maffi, and Harmon, we believe that “la humanidad progresará realmente en el siglo XXI si emprende una acción conjunta para conservar y restablecer la elasticidad y vitalidad de nuestros ecosistemas, culturas y lenguas, de los que depende la vida de las generaciones futuras” (Skutnabb-Kangas, Maffi, and Harmon 2003, 44). As such, the educational treatment of the notion of biocultural diversity aims to contribute to a posture of respect and interdependence with the natural and social environment, promoting the development of competences that allows children to have a greater knowledge of their context (Batista 2017; Batista and Andrade 2018). It is important to create new contexts of learning, through contact with local environments and members of the community with different life experiences. What matters is that the child can create connections and understand the impacts of their actions through the recognition of the synergy that exists among linguistic, cultural, and biological diversity, or as we prefer to call it, biocultural diversity. This can be achieved by an awareness that the human being is nothing more than one of the billions of species that must live interdependently with the environment, without the need for consumption beyond its basic needs. The latter point on sustainable consumption is included in the definition of the concept of sustainable development and is seen as a way of responding to the basic needs of current generations, without compromising the well-being of future generations of all animal and plant living species that cohabit the planet with us. Furthermore, it is important not only to educate children on current local and global problems but also to consider teacher education programs.

Although the concept of biocultural diversity is more academically oriented toward the study of indigenous populations and how they live with the surrounding natural and social environment, several authors have found that those populations live in interdependence with the environment, developing more sustainable ways of life (Toledo and Barrera-Bassols 2008; Harmon and Loh 2010; Maffi and Woodley, 2010; Elands et al., 2019). In this sense, Poole (2018) mentioned that there is a gap in the SDGs, suggesting that “the loss of cultural heritage [...] is a major contributor to environmental crises and, incidentally, the creation of poverty more generally, and these dynamics must be acknowledged as priority that must be

addressed” (Poole 2018, 56), which can result in the loss of environmental, culture, and linguistic knowledge that affects the well-being of all species. Thus, if we consider our lives to be interconnected with the environment, it is therefore important to promote systemic and inclusive educational approaches that recognize the diversity of views that exist regarding the relationship between human beings and the natural and social environment that surrounds them (Maffi and Woodley, 2010; Merçon et al., 2019; Hanspach et al., 2020).

So, recognizing the importance of education for sustainable development, in this article, we present a study, guided by the SDGs and contemplating education for biocultural diversity, which consists of analyzing a set of normative-legal documents that integrate the Portuguese educational system and that guide primary education in Portugal.

The Portuguese education system is structured in three levels, which are organized by cycles of schooling. A child initiates his/her process of formal education in kindergarten and at 5 or 6 years old enters in primary education. After that, children enter into secondary education, and finally, we have high school. In this study, we analyze documents that cover all cycles of schooling in the Portuguese context. However, our interest is focused on primary education.

Sustainable Development and Biocultural Diversity Competences

The objective of the study was to identify and understand what the normative-legal documents selected say about education in Portugal on biocultural diversity and its relationship with sustainable development. In this case, knowing that education for sustainable development should promote the development of transversal competences throughout life, we decided to focus on the (re)construction of a set of descriptors centered on biocultural diversity.

We understand the term competency as the interaction of cognitive and noncognitive components (Barth et al., 2007) that enhance the development of higher stages of awareness and the construction of personal mental frameworks supported by different knowledges, skills, attitudes, values, and predispositions that allow the subject to act in order “to discover and to analyze his/her value system, and to review it with respect to its adequacy to reality” (Barth et al., 2007, 4). Thus, the framework of competences built and which we present below for this study assumes that education for biocultural diversity is a fundamental element for sustainable development. As such, reinforcing the idea of competences such as “the ability to face complex demands, and supporting and mobilizing psychosocial resources (including skills and attitudes) in a particular context” (Organização para a Cooperação e , 3) based on the promotion of “a complete set of knowledge, skills, attitudes, values, emotions, and motivations that subjects put into action in their contexts to answer the requirements of situations” (Solís 2014, 49), the competences that we defined with support of other reference frames (Barth et al., 2007; Wiek et al., 2011; Rieckmann 2012; Wiek et al., 2016; United Nations Educational Scientific and

Cultural Organization 2017) are as follows: systemic thinking competence, anticipatory competence, normative competence, interpersonal competence, and strategic competence.

The document “Education for Sustainable Development Goals: Learning Objectives” (United Nations Educational Scientific and Cultural Organization 2017) presents a set of eight key competences: systemic thinking competency, collaboration competency, strategic competency, normative competency, anticipatory competency, critical thinking competency, self-knowledge competency, and integrated problem solving competency. Within the context of education for sustainable development, these are understood as necessary for all citizens, as they contribute to planning of individual and joint action in different contexts and situations of different complexities. It reinforces the idea that competences are not taught but developed through experiences and reflections arising from the actions of individuals. Thus, educating for sustainable development constitutes an educational action that promotes personal and joint experiences and reflections on human actions and their current and future cultural, social, political, economic, and environmental impacts at different scales.

In Portugal, several studies have been carried out on key competences for sustainability, emphasizing not only their importance but also adequate methods for their promotion and results relating to times when there is work oriented toward their development, highlighting the study by Azeiteiro et al. (2015), Lozano et al. (2019), Juuti et al. (2021), and Oliveira (2020). Thus, Azeiteiro et al. (2015) presented a study that focused on conducting training programs on skills for sustainability in an e-learning format and academic context, where they observed that participating students showed high levels of motivation and satisfaction about their participation in these programs. When the self-assessment was carried out, the students stated that they had a greater perception of the sustainability skills promoted. These authors were based on competency frameworks supported by Lambrechts et al. (2013) and Rieckman (2012), for example, noting that skills aimed at personal involvement, emotional intelligence, and interdisciplinary work were expedited. In addition to the above, the same authors state that the key competences for sustainability are “related to acquired knowledge, skills, and attitudes that enable successful task performance and problem solving with respect to real-world sustainability problems, challenges, and opportunities” (Azeiteiro et al., 2015, 310), and it is important that education contributes to sustainability through not only critical and systemic thinking but also inter- and transdisciplinary. Thus, the authors believe that, through transformative social learning, it is possible to contribute to the development of skills that allow individuals to manage and change the social structures in which we find ourselves.

Lozano et al. (2019), in turn, developed a curriculum analysis in the context of higher education, where they realized the need for work around the development of competences, in order to respond to the challenges that arise in a necessary, appropriate, or possible way and through diverse and combined pedagogical approaches. The authors also refer those traditional pedagogical approaches must be rethought in a way that they can really

promote the development of competences since, at the moment, the same is not happening. Thus, they propose that traditional approaches be redesigned and complemented with other approaches, in order to contribute to richer educational contexts that are conducive to their development. This analysis also showed that cross-cutting themes and social issues have been worked on more in an academic context, with economic issues being the least addressed when compared to the three pillars of sustainability.

Juuti et al. (2021) through an analysis focused on the key competences for the sustainability of a set of normative-legal documents carried out in different countries; they conclude that, in general, all contexts contemplate opportunities that place education for sustainability as an educational concern. This requires the articulation of various dimensions of knowledge as well as the understanding, action, and reflection on the world and possibilities of transforming it through a framework of transversal skills, as seen in the study by Azeiteiro et al. (2015).

Finally, Oliveira (2020) proposed that the work around competences for sustainability should focus on a holistic approach through integrative thinking, inclusion, and the ability to know how to deal with complexity. The study also proposes that skills be promoted in order to contribute to learning from the past through active involvement and the exploration of alternative futures, with a view to lifelong learning and the recognition that skills do not exist but associated to a context and action.

As such, in order to contribute to the development of competences that allows the resolution of problems through respect for the challenges and opportunities that individuals face, the framework of competences presented in the methodological part below was developed. This was developed based on the abovementioned UNESCO document and other authors who have looked at the key competences of education for sustainable development (Barth et al., 2007; Wiek et al., 2011; Rieckmann 2012; Wiek et al., 2016). The categories of analysis used were rethought and redefined based on those key competences, and our set of competences is as follows: systemic thinking competency, anticipatory competency, normative competency, strategic competency, and interpersonal competency.

METHODOLOGICAL PROCESS

This qualitative research is characterized as an exploratory and descriptive study, supported in the interpretive paradigm, in which we sought to answer the research question: What is the place of biocultural diversity, in a perspective of sustainable development, in a set of normative-legal documents that govern primary education in the Portuguese educational system? In terms of objectives, this study intends to 1) identify which competences for biocultural diversity in a perspective of sustainable development are most commonly referred to in the normative-legal documents, 2) understand how biocultural diversity is referenced in the documents selected for the Portuguese educational context at the level of primary

education, and 3) identify what knowledge learners are expected to develop in primary education on biocultural diversity and sustainable development. The attempt to answer the research question thus led to the development of a set of categories and descriptors that contemplate education for biocultural diversity, from a perspective of sustainable development.

Corpus Selection

To select the corpus of analysis, some criteria that allowed the authors to select a corpus of seven documents to analyze were considered. In order to understand the functioning of the Portuguese educational system, it is important to consider different views from documents of a different nature, and the first criterion was to identify documents that addressed issues of education for sustainable development and citizenship, since these are two areas closely related to biocultural diversity. Thus, documents such as the Education for Development Framework, the Environmental Education for Sustainability Framework, the Consumer Education Framework, and the National Strategy for Citizenship Education were included in the corpus. As for the second selection criterion, the authors selected documents that serve as guidance for the work of educational agents, in particular those in primary education. As a result, the selected documents were the Profile of Students Leaving Mandatory Schooling, the Framework Document for Essential Learning, and the Basic Law of the Portuguese Educational System. Although the profiles of the selected documents are quite diverse, that is, from documents of a legal nature to documents more focused on providing guidance, all seven documents are considered fundamental in the context of primary education in Portugal.

All the documents referred above are available for download at the website of the Portuguese General Directorate of Education, with exception for the Basic Law of the Portuguese Educational System. For the first case, the framework and the National Strategy for Citizenship Education are found in the “Education for Citizenship” section of the Ministry of Education website.¹ On the same website, both the Profile of Students Leaving Mandatory Schooling and the Framework Document for Essential Learning can be found in the “Syllabus” tab. The Basic Law of the Portuguese Educational System can be found on the website of the “Electronic Journal of the Republic.”²

As a way of responding to the authors’ research interests, the documentary analysis was oriented toward primary education, given that the documents analyzed refer to several schooling cycles, *viz.* from kindergarten education to secondary education. The process of data analysis for this study is a documentary analysis characterized by sources produced “with a contemporary practical purpose of the reality to which they refer” (Bell 2010, 105). This is intended as a way to represent and obtain the greatest amount of pertinent information as possible (Bardin

¹<https://cidadania.dge.mec.pt/documentos-referencia>

²<https://dre.pt/web/guest/legislacao-consolidada/-/lc/34444975/view?consolidacaoTag=Educa%C3%A7%C3%A3o+e+Ensino>

TABLE 2 | The seven documents of the Portuguese educational system under analysis.

Title (year)	Synthesis
Education for development framework (2016)	Guiding document for education for development as a dimension of education for citizenship. Guideline that focuses on pedagogical and didactic issues, providing several suggestions to educational agents that could use it
Consumer education framework (2019)	Guiding document for education for development as a dimension of education for citizenship. Aiming a pedagogical-didactic intervention on another of the several dimensions of education for citizenship these documents are made for
Environmental education framework for sustainability (2018)	Guiding document for education for development as a dimension of education for citizenship. It is a guideline more focused in the environmental education and contemplates all the cycles of schooling
Profile of students leaving mandatory schooling (2017)	Reference matrix concerning the organization of the Portuguese educational system. This document is oriented and organized according to ten areas of competences that try to train children/students as global citizens, through a humanist-based profile, and contribute to “a definição de estratégias, metodologias e procedimentos pedagógico-didáticos a utilizar na prática letiva” (Martins coord. et al. (2017), 8) and highlighting what you expect children and young people to achieve at the end of their mandatory education
National strategy for citizenship education (2017)	Generalist document that aims a citizen education and formation of children and young people so that “no futuro sejam adultos e adultas com uma conduta cívica que privilegia a igualdade nas relações interpessoais, a integração da diferença, o respeito pelos direitos humanos e a valorização de conceitos e valores de cidadania democrática” Monteiro et al. (2017), 1, without forgetting teacher education
Basic law of the Portuguese educational system (1976)	Law that establishes the general framework of the Portuguese educational system. The basic law of the Portuguese educational system organizes the Portuguese education from kindergarten education to higher education, including professional training, adult education, distance learning, and Portuguese teaching abroad. Promotes educational work around values capable that can lead to more sustainable societies, values such as solidarity, democracy, justice, and equity
Framework document for essential learning (2017)	Curricular reform developed in connection with the profile of students leaving mandatory schooling. Contemplates the principles by which essential learning is guided

1977), in an attempt to meet the predefined objectives. **Table 2** presents a clearer understanding of the corpus of selected documents.

Analysis of the Data

Considering our research objectives, to understand how biocultural diversity appears in documents guiding teachers in the primary education in Portugal, we used a set of competences for sustainable development presented above. Thus, based on the document entitled “Education for Sustainable Development Goals: Learning Objectives” (United Nations Educational Scientific and Cultural Organization 2017) and other leading authors (Barth et al., 2007; Wiek et al., 2011; Rieckmann 2012; Wiek et al., 2016) regarding the key competences in Education for Sustainable Development, we defined the following categories of analysis: systemic thinking competency, anticipatory competency, normative competency, strategic competency, and interpersonal competency. Below, we resent definitions of the competences selected:

- a) Systemic thinking competency is about the ability to analyze comprehensively different complex system domains (e.g., society, environment, and economy) and scales (local or global). Based on this competency, we are expected to be able to address issues of sustainable development with a focus on systemic knowledge (associated with cause-and-effect relationships, perceptions, motives, and decisions) and analytical skills (based on understanding, empirical verification, and articulation of system structures).
- b) Anticipatory competency is focused on possible future trajectories and scenarios. We are, collectively, expected to analyze, evaluate, and craft issues related to sustainable

development in order to contribute to future-oriented knowledge and skills.

- c) Normative competency predicts the development of the ability to collectively map, specify, apply, reconcile, and negotiate values, principles, goals, and targets related to sustainable development. It is a competency based on the development of normative knowledge about justice, equity, socio-ecological integrity, and ethics, through skills such as multi-criteria assessment and structured visioning.
- d) Strategic competency is about our ability to design and implement interventions related to sustainable development and involves familiarity with real-world situations and relationships. In terms of strategic knowledge, this is a competency related to viability, feasibility, effectiveness, and efficiency. The related skills are about designing, testing, implementing, evaluating, and adapting (policies, action plans, collaboration, ...).
- e) Interpersonal competency, in turn, focuses on motivation, engagement, and facilitation of collaboration and participation in problem-solving. It includes skills of communications, negotiation, collaboration, leadership, and pluralistic and transcultural thinking. This competency is oriented to individual and collective actions, focusing on cooperation toward equity, solidarity, and justice between people (Wiek et al., 2011; Wiek et al., 2016; Juuti et al., 2021).

After presenting the key competences selected, a pre-analysis of the selected documents was carried out with support of WebQDA software³. From this pre-analysis, our subcategories of analysis

³<https://www.webqda.net>

TABLE 3 | Analysis categories.

Categories	Subcategories
Systemic thinking competency	Recognize that we live in a globalized, diverse, and interdependent world, where languages and cultures play an important role Analyze everyday situations and be able to reflect and act critically to solve linguistic, cultural, and environmental sustainability problems
Anticipatory competency	Understand the influences and relationships between languages, cultures, and natural and social environments Identify aspects of biocultural sustainability that are striking from the present and the past and how they can influence our future Understand and evaluate different scenarios (possible, probable, and improbable) on linguistic, cultural, and environmental sustainability Being able to deal with situations of risk and uncertainty that influence biocultural sustainability Predict and evaluate the consequences and impacts of their actions, whether individual or collective, in view of biocultural sustainability
Normative competency	Establish lasting synergy relationships between cultural, biological, and linguistic systems through political, ethical, and scientific innovation Know and respect the rights and duties of a democratic society Understand and reflect on the norms and values that underlie human actions and their relationship with the natural and social environment
Strategic competency	Conceive, implement, and/or participate, individually and/or collectively, in innovative actions that contribute to the enhancement of biocultural diversity and to sustainability, from the local to the global context Search for solutions to local and/or global problems, through an interventionist, critical, and collaborative action from different perspectives and from different languages and cultures
Interpersonal competency	Participate and facilitate collaboration in moments of problem-solving on biocultural sustainability Valuing and respecting the needs, perspectives, and actions of others in favor of sustainability Be sensitive and contribute to the well-being of the individual and society in environmental, social, cultural, and linguistic terms Recognize that different cultures may presuppose different worldviews and different forms of relationship with the natural and social environment Demonstrate openness to learning and sharing biocultural knowledge with others

emerged, which are also known as competency descriptors, which were then discussed and reformulated, finally constituting the analytical framework. This is a competency framework for education for biocultural diversity developed on the basis of key competences of education for sustainable development. Considering the objectives of this research, the process of building the subcategories and analyzing them was focused on biocultural diversity from a perspective of education for sustainable development. After defining the categories for analysis, the codification of different recorded units was initiated. With that in mind, it is important to emphasize, once again, that our analysis focuses specifically on primary education (although the selected documents are organized by the different schooling cycles) and issues related to biocultural diversity. **Table 3** shows the categories and subcategories of analysis.

RESULTS

Our analysis was focused on a set of normative-legal documents using categories built from the competency frameworks referred previously (Barth et al., 2007; Wiek et al., 2011; Rieckmann 2012; Wiek et al., 2016; United Nations Educational Scientific and Cultural Organization 2017). Thus, the competences were used like categories, and the descriptors were redefined so they could respond to the needs of our study, focused on biocultural diversity issues. The process of analysis was carried out in three phases, all performed by the authors: 1) a pre-analysis for (re) definition of

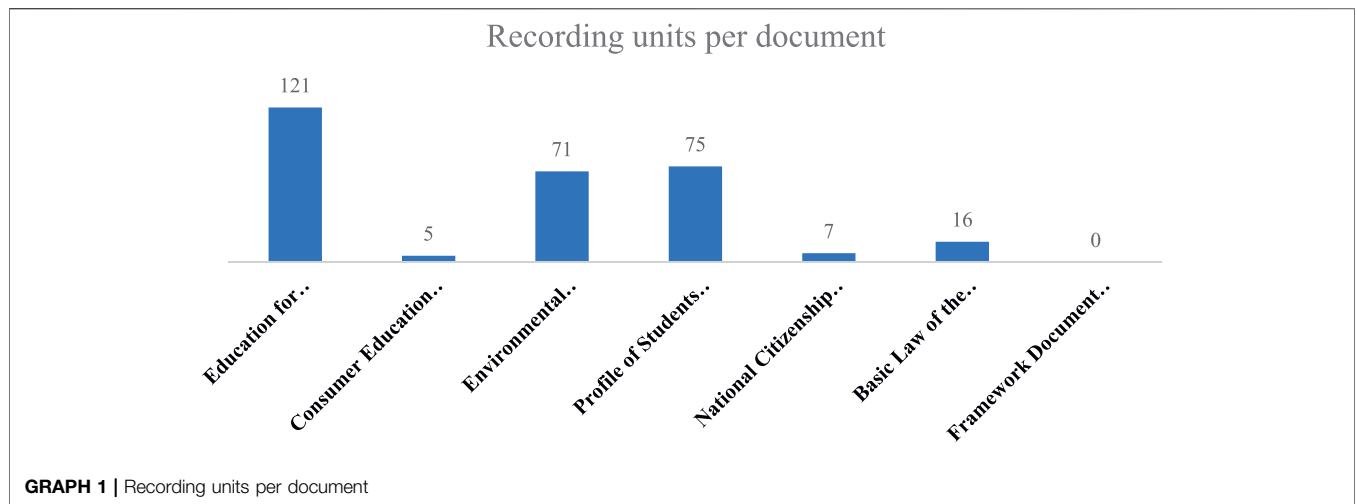
the descriptors, 2) a documentary analysis of the selected corpus, and 3) a review of the documentary analysis. The process was carried out with support of WebQDA software, which allowed the codification of recording units and gave us a clearer perception of our data.

General Results From the Analysis of the Corpus

When we analyze graph 1, we can see that the document with the highest number of records is the Education for Development Framework, followed by the Profile of Students Leaving Mandatory Schooling, and finally, the Environmental Education Framework for Sustainability.

Graph 1: Recording Units per Document

From this first analysis, we realized that there are few documents focused on issues related to biocultural diversity and its axes in an explicit way, since only three of the seven documents under analysis had more than 50 recording units on the subject. Thus, it seems that there is still no clear attention to issues related to biocultural diversity or its integral axes (linguistic, cultural, and biological diversity), since the selected recording units are often indirect and more focused on biological or cultural diversity and not on the relationships between them. The typology of the document (more focused on a logic of “how to teach?” and “how to learn?”) does not seem to be a relevant factor. This initial analysis thus reveals that most documents show little attention to



GRAPH 1 | Recording units per document

TABLE 4 | Representativeness of competences in the analysis corpus.

	Systemic thinking competency	Anticipatory competency	Normative competency	Strategic competency	Interpersonal competency
Education for development framework	48	10	29	15	19
Consumer education framework	3	2	0	0	0
Environmental education framework for sustainability	31	19	3	12	6
Profile of students leaving mandatory schooling	9	9	14	15	28
National strategy for citizenship education	3	0	3	1	0
Basic law of the Portuguese educational system	7	0	0	3	6
Framework document for essential learning	0	0	0	0	0
Total	103	40	49	46	59

biocultural issues, despite the identification of more than three hundred recording units.

Competences and Descriptors of an Education for Biocultural Diversity

Regarding the analyzed documents and the presence of different competences in them, it was found that the representativeness of each competency varies, which means that the documents are oriented toward different axes of education for biocultural diversity and sustainable development. Thus, as can be seen in Table 4, the Education for Development Framework, together with the Consumer Education Framework, and the Environmental Education for Sustainability Framework are mainly focused on the systemic thinking competency. As was seen above, this competency is oriented toward a comprehension of the world and how systems are embedded into different domains and scales. The references found that this competency focused on issues related with raising awareness, understanding the causes of development problems and inequalities, and the recognition that we live in an interdependent and globalized context. It is assumed that through understanding the systems in which we are inserted and with which we interact, our actions will become more aware and pondered, covering the four pillars of education for sustainable development (environmental, cultural, social, and

economic) without disregarding biocultural diversity. Examples from the corpus referring to systemic thinking are “awareness and understanding about the causes of development problems and inequalities at local and global levels, in a context of interdependence and globalization, with the aim of promoting the right and duty for all persons, and all peoples to participate and contribute to integral and sustainable development” or “students are able to identify in which places and in which relational contexts (human beings/other living beings/nature) they were building their identities and are able to recognize other belongings and identities (personal and collective) built from other places and other relational contexts” (Torres et al., 2016).

The Profile of Students Leaving Mandatory Schooling and the Basic Law of the Educational System contain a greater number of records related to interpersonal competency, also known as the competency for participation and collaboration in the co-construction of knowledge and practical solutions to solve problems that we face as a species (Juuti et al., 2021; Wiek et al., 2011). This competency comes with an orientation toward the personal and collective well-being of society (which includes culture and language) and environment, through an education focused on attitudes and values such as respect, appreciation, collaboration, and collective participation. This means an education that allows individuals to contribute to more sustainable societies, through the recognition that

different cultures may adopt different worldviews and different forms of relationship with the natural and social environment. The Basic Law of the Educational System emphasizes, among others, the importance of “valuing different knowledge and cultures” (Torres et al., 2016). The Profile of Students Leaving Mandatory Schooling contains recording units such as “interacting with tolerance, empathy, responsibility, and arguing, negotiating, and accepting different points of view, developing new ways of being, and looking to participate in society” or “showing respect for a human and cultural diversity and acting in accordance with the principles of human rights” (coord. et al. (2017)).

Anticipatory competency is mostly represented in the Environmental Education for Sustainability Framework. Anticipatory competency is focused on how we deal with possible future scenarios, namely, those related to sustainability. Although this document presents recording units mostly referring to the environmental pillar of sustainable development and the biological pillar of biocultural diversity, it is also the document in the corpus that presents the most references for anticipatory competency. This shows that anticipatory competency does not appear in any of the corpus’s documents in a clear and interrelated way with the different dimensions of sustainability and biocultural diversity and should therefore be rethought. The corpus contains the following recording units:

“to recognize the importance of consciously using natural resources in a way that does not compromise the needs of future generations” and “to recognize the consequences of human activities and attitudes in different ecosystems”: both from the Environmental Education Framework for Sustainability.

Normative competency, in turn, can be found in 29 of the 49 recording units in the Education for Development Framework. This competency refers to the development of the ability to negotiate, analyze, and reflect about sustainable values, principles, and goals (Wiek et al., 2011). The recording units that refer to this competency are focused on principles and norms that serve as the basis for individual and collective life in society, in order to ensure the well-being of all species and contribute to the construction of a more just world through respect for the rights and duties of everyone. The Development Education Framework, for instance, indicates that “the pedagogical process that combines cognitive skills with the acquisition of values and attitudes, which aims at building a more just world, in which all people can share access to power and resources” or that “students understand that justice concerns the equal rights and duties of all citizens, pointing to a set of principles and socially legitimated norms that guide the lives of people and which are applied as a means of maintaining security, promoting social well-being, and fighting all forms of discrimination” (Torres et al., 2016).

Finally, the strategic competency shows a similar presence in the three documents with the highest number of references, although in no case does it exceed 15 recording units. Strategic competency refers to the ability to design and implement collectively and collaboratively strategies and plans that could contribute to sustainability. Through the search for

solutions to local and global problems, the aim is to design, implement, and participate in actions that contribute to value and preserve biocultural diversity and sustainability. Thus, this category occurs in recording units such as “the students recognize and take ownership of their share of power and responsibility in creating conditions that, on the one hand, reverse the increase and continuation of inequalities, poverty, and social exclusion and, on the other hand, allow to improve the well-being of all people, communities, and peoples” (Torres et al., 2016) or “the school empowers young people with knowledge and values to build a more just society, centered on the person, human dignity, and action in the world as a common good to preserve” (coord. et al. (2017)).

Thus, we can see that the documents show a predominance and attention to interpersonal and systems thinking competences. Although we do not see a clear concern with biocultural diversity, our codes seem to have a focus on the comprehension, recognition, or identification of the relations among culture, language, and biology, such as in this recording unit of Profile of Students Leaving Mandatory Schooling: “understand the balances and weaknesses of the natural world in adopting behaviors that respond to the great global challenges of the environment.” In this general analysis, we could understand that despite there being recording units for all categories, the link between biocultural diversity and sustainable development is often missing.

Since the Profile of Students Leaving Mandatory Schooling is a reference document for the organization of the educational system and aimed at the formation of global citizens prepared to live in a world in constant interaction with local and global issues, the prevalence of interpersonal competency in this document is justified and understood. The same goes for the Basic Law of the Educational System: a document that proposes the global development and the identity construction of the student/child as an individual in constant relationship with the world around him/her. In the references oriented toward the systemic thinking competency, the student is expected to understand and recognize the existing relationships between the current globalized world in which we find ourselves and biology, language, and culture as possibilities at the service of the development of the remaining competences, understood as transversal, and in development throughout life.

If we look at the absolute values of each of the categories of analysis, it can be seen, once again, that the systemic thinking and interpersonal competences appear with 103 and 59 recording units, respectively. The other competences each have total values between 40 and 50 references each. Thus, it seems there is a low concern about understanding and recognizing the existing relationships between human beings, and their language, culture, and nature. This contributes to the lack of understanding and knowing that the world is cohabited by other species and, naturally, by people with different principles, ideals, ways of life, and thoughts, who, through work based on respect, collaboration, and solidarity, can together contribute to the preservation of diversity, for example, “they also recognize themselves as active participants in this process, assuming their social responsibility in building

TABLE 5 | Categories and subcategories of analysis.

Categories	Subcategories	Ref
Systemic thinking competency	Recognize that we live in a globalized, diverse, and interdependent world, where languages and cultures play an important role	39
	Analyze everyday situations and be able to reflect and act critically to solve linguistic, cultural, and environmental sustainability problems	30
	Understand the influences and relationships between languages, cultures, and natural and social environments	34
Anticipatory competency	Identify aspects of biocultural sustainability that are striking from the present and the past and how they can influence our future	10
	Understand and evaluate different scenarios (possible, probable, and improbable) on linguistic, cultural, and environmental sustainability	6
	Being able to deal with situations of risk and uncertainty that influence biocultural sustainability	5
	Predict and evaluate the consequences and impacts of their actions, whether individual or collective, in view of biocultural sustainability	19
Normative competency	Establish lasting synergy relationships between cultural, biological, and linguistic systems through political, ethical, and scientific innovation	12
	Know and respect the rights and duties of a democratic society	22
	Understand and reflect on the norms and values that underlie human actions and their relationship with the natural and social environment	15
Strategic competency	Conceive, implement, and/or participate, individually and/or collectively, in innovative actions that contribute to the enhancement of biocultural diversity and to sustainability, from the local to the global context	23
	Search for solutions to local and/or global problems, through an interventionist, critical, and collaborative action from different perspectives and from different languages and cultures	23
Interpersonal competency	Participate and facilitate collaboration in moments of problem-solving on biocultural sustainability	16
	Valuing and respecting the needs, perspectives, and actions of others in favor of sustainability	18
	Be sensitive and contribute to the well-being of the individual and society in environmental, social, cultural, and linguistic terms	10
	Recognize that different cultures may presuppose different worldviews and different forms of relationship with the natural and social environment	11
	Demonstrate openness to learning and sharing biocultural knowledge with others	4

and participating in relationships and interconnections that promote human dignity and respect for nature” (Torres et al., 2016). The few relations identified in the recording units about biocultural diversity are rarely associated to sustainable development issues. So, although our corpus of analysis does have references related to biocultural diversity—with an emphasis to relations between culture and biology—in most cases, they are not related to sustainable development or with any dimension of biocultural diversity, as we can see through the recording unit “students are able to identify in which places and in which relational contexts (human beings/other living beings/nature) they were building their belongings and identities and are able to recognize other belongings and identities (personal and collective) built from other places and other relational contexts” (Torres et al., 2016). With a more specific focus on the subcategories under analysis, that is, the competency descriptors, we seek to understand what exists in the documents that is related to sustainable development. In **Table 5**, going through the competency descriptors, it is possible to perceive, for example, that the descriptors under the systemic thinking competency have little variation in the number of occurrences, since the descriptor with the fewest recording units has 30 and the descriptor with the most has 39. In this sense, it is important not only to recognize the role of biocultural diversity and its relationships today in a globalized, diverse, and interdependent world but also that children can analyze and reflect on everyday situations related to biocultural sustainability, understanding their influences and impacts on our life in the short, medium, and long term, and between languages,

cultures, and natural and social environments. Regarding the anticipatory competency, some descriptors show higher numbers than others, and there is variation within the different components of the competency, that is, some are identified in the corpus, but others less so. In this case, it seems to us that there is a greater concern with identification and forecasting, instead of an education for understanding and the ability to deal with situations of risk and uncertainty. The subcategories with the highest number of recordings are related to aspects of biocultural diversity from the present and the past, and how they can influence our future. In other words, it is proposed in the documents to think and identify how and what consequences certain events may have on the well-being of all species and the planet. A reflection of individual actions have considerable references, and children are expected to predict and evaluate the impacts and consequences of their actions, either individually or collectively. The importance of the two descriptors with fewer references should however be emphasized, since we live in a world characterized by unpredictability. So, we must learn from an early age to deal with situations that we do not feel comfortable with, as a way to mobilize other skills that allow better adaptability to the situations and problems that we face.

Normative competency also reveals some variation in the recording units collected. In this case, there is a clear concern in the selected documents regarding knowledge and respect for individual and collective rights and duties, in order to live in society. It is also expected, as with the competency of systemic thinking, that the relationships among cultural, biological, and linguistic systems are understood, knowing their past and

TABLE 6 | Explicit translated references in the documentary corpus to biocultural diversity and sustainable development.

Education for development framework	Valuing diversity in terms of nature, ecosystems, and human ways of life
	Understand the interrelationships between people, places, economies, and environments, from local to global and vice versa Give examples of people and places with which they establish bonds of mutual dependence Present examples of relationships between human beings and the rest of nature Become aware of the need to care for and preserve human life and the rest of nature Students are able to identify in which places and in which relational contexts (human beings/other living beings/nature) they were building their belongings and identities and are able to recognize other belongings and identities (personal and collective) built from other places and other relational contexts Identify factors of the physical environment that condition human life and that of other living beings They also recognize themselves as active participants in this process, assuming their social responsibility in building and participating in relationships and interconnections that promote human dignity and respect for nature
Consumer education framework	Reflect on their consumption habits, made concrete in their choices and decisions, taking into account environmental challenges, respect for other people, other cultures, and other countries, and respect for themselves and for future generations
Profile of students leaving mandatory schooling	School enables young people with knowledge and values to build a more just society, centered on the person, human dignity, and action on the world as a common good to preserve
—	To manifest environmental and social awareness and responsibility, working collaboratively for the common good, with a view to building a sustainable future

influences. This, consequently, will contribute to individual and collective, political, cultural, social, and economic measures, taking into account the various components present in biocultural diversity and promoting a path to sustainable development.

Strategic competency and its subcategories each have similar numbers of references. It is important that, in general, children can seek individual and collective solutions and make decisions to participate and create possibilities, in a local and global context, recognizing and including diverse perspectives, to value biocultural diversity as a path to sustainable development.

The last category under analysis has five descriptors, which are also present in the documents in a balanced way. From the analysis carried out, it seems to us that valuing and respecting the subjects' needs, perspectives, and actions are quite relevant. In other words, it is important that children get to know and contact with each other and listen to each other to understand interests, ideas, tastes, and needs related to sustainability. Related to strategic and interpersonal competences, the first descriptor highlights the participation and facilitation of collaboration in solving common problems, which will allow action in the community with a view to the construction of the common good, be it local or global. Finally, sensitivity to others and acting in favor of their well-being, recognizing individual characteristics, and showing openness to learning and sharing knowledge with others also appear as descriptors to be considered in the development of interpersonal competency.

Presence of Words Derived From Sustainable Development and Biocultural Diversity in the Corpus

The support software used (WebQDA) has functions that allow it to understand and collect, through small surveys, some of the objectives under analysis. In this case, it was possible to see that words like “sustainability,” “development,” and “sustainable” are much more common in the analyzed documents than “diversity,” “culture,” “language,” or “biology,” for example. The list of twenty

most common words in the documentary corpus shows “development” in fourth place, “sustainability” in seventh, and “sustainable” in twelfth. These data suggest that the documents under analysis show clearer and more explicit attention to sustainable development. Of course, we need to consider that some of the documents under analysis contain in their title the word development or sustainability, and this counts to the number of words. Nevertheless, from our reading and analysis of the data collected, we see a clearer vision of sustainable development than biocultural diversity.

When talking about the most common action descriptors in our recording units, we found the words “understand” (401 references), “recognize” (323 references), “know” (262 references), and “identify” (255 references) as the most present in our corpus. This shows us that the documents under analysis pay more attention to cognitive issues. It is not always clear that the child is expected to be able to act based on a set of knowledge, skills, attitudes, and values with a view of changing and solving complex problems related to sustainable development and through promotion and reflection on the relation among the surrounding language, culture, and biology.

After the analysis of the most representative words in the corpus, we tried to understand how the theme of biocultural diversity would be present, by searching for the terms “culture(s),” “language(s),” “biology,” “diversity,” “biocultural diversity,” “linguistic diversity,” “cultural diversity,” and “biological diversity.” Culture-related issues appear in the documents 177 times, while language has 13 references and biology/biological only one. Biological diversity or biodiversity, in turn, has 118 occurrences, cultural diversity has 8, and linguistic diversity has none. This research allowed us to realize that there is an attention to cultural and biological issues, even though they do not always mean to concern with diversity and the relationships that exist between them. The word diversity appears 164 times in the documents, and we saw that the recording units associated with it mainly refer to issues of biological diversity. There are some cases when diversity is

TABLE 7 | Main learnings to be developed by children about biocultural diversity and sustainable development.

Recognize the causes and consequences of individual and/or collective actions	Assume a role as an active agent in building a biocultural sustainable world
Adopt behaviors that respond to local and global challenges Understanding the natural and social realities of the world around them Respect of diversity	Understanding the interdependence of existing relationships between different systems Develop and promote actions on, in, and with the biocultural sustainable context —

oriented toward cultural diversity; however, there are rare situations in which biocultural diversity is perceived. There is a clear difference between the attention given at sustainable development and biocultural diversity in the analyzed documents since, in general, there is greater attention to educational work aiming at sustainable development and specifying it in descriptors, learning, and guidelines, which does not happen with the theme of biocultural diversity.

DISCUSSION

This exploratory and descriptive study of a qualitative nature has provided a broader understanding of the presence of recording units associated with education for biocultural diversity, in the context of education for sustainable development in primary education. Looking at the main guiding documents of the Portuguese educational system, we can see that education for sustainable development is present, namely, in an environmental perspective, as shown in the Environmental Education for Sustainability Framework. The theme of biocultural diversity is, in turn, represented in a very unclear way. We can say that references associated to biocultural diversity emerge, in most cases, associated with the different diversities that constitute it, with an emphasis on learning that enables the identification, understanding, and recognition of aspects related to the theme (relationships that address issues associated to biocultural diversity and/or the theme of sustainable development). In other words, the documents refer in an implicit way to biocultural diversity, in order to make understandable the causes, consequences, and influences of human actions in the natural and social environment, particularly the latter of these two, in reference to an education concerned with sustainable development.

From the 330 recording units selected, only 24 (Table 6) show the relationships among biological diversity, linguistic and/or cultural diversity, and sustainable development, with linguistic diversity rarely represented. This result is perhaps justified by the different understandings associated with language and its role in the construction of knowledge, promotion of social cohesion, and identities. Thus, it is important to understand language not only as a set of grammatical rules but also as a way for human beings to develop their identities and build knowledge and learning in a way that is connected with the natural and social environment. As such, languages must be understood as dependent and in constant interaction with the environment (Posey 1999; Maffi 2001). We believe that when this perspective is considered, more references will be made to linguistic diversity and its role in building a more sustainable future.

Regarding the last objective of this study, aimed at identifying the knowledge that learners are expected to build on biocultural diversity and sustainable development, the documents are oriented toward the identification, recognition, and understanding of the systems that surround them and the relationships these systems establish with each other. Some codes emphasize the importance of action and reflection, however with less emphasis than identification or recognizing, as mentioned above. In this case, we tried to systematize, in Table 7, the most mentioned descriptors in our recording units and found that an education allows learners to understand the consequences and causes of actions, whether individual or collective, at the cultural, social, environmental, and economic level. Associated with the competency of systemic thinking, there is also the recognition of the interdependent relationships that exist between the different systems, as well as a growing understanding of the social and natural realities of the world. Contextual issues are also considered, either when associated with local action, or in relation to the identification of problems or the relationships and learning that can be developed in a natural and social environment. Finally, we could also see that although there are no clear references to biocultural diversity, respect for diversity is highly valued even though there is no specific description of how it can be promoted.

As discussed above, educating for sustainable development implies an education for biocultural diversity—to manifest environmental and social awareness and responsibility, and working collaboratively for the common good, with a view to building a sustainable future (coord. et al. (2017)). Thus, in this sense, there is a gap in the normative-legal documents that govern education in Portugal in the context of primary education regarding the treatment of biocultural diversity, in contact with the natural environment.

In this sense, education must be oriented toward the development of a learning that enables children to think critically and understand historical, political, social, and economic relationships linked to current events. We should expect an education for biocultural diversity, in a perspective of sustainable development, which responds to the interests and worldviews of human beings, without forgetting the well-being of all communities and species, surpassing a consumerist and anthropocentric perspective, and reconciling relations with the natural and social environment. We should also expect an education inside the community, which respect and values the others and their knowledge, promoting the development of an individual and collective identity, with respect for all citizens, in the valorization of the natural environment.

Although not always explicit in the analyzed documents, we understand an education for biocultural diversity like an

education that contributes to live in a different world, valuing unity in diversity without forgetting an education for relationships and connections, in which all educational agents when entering the physical space that is the school do not forget the world outside. Educating for biocultural diversity is, for us, seen as educating for sustainable development insofar as concerns associated with the social, environmental, and economic spheres are faced based on a personal, linguistic, cultural, and environmental history to consider, respect, value, and to preserve. Only through an interconnected relationship with the environment, we can move toward sustainable development.

CONCLUSION

Based on the above, the present study allows us to observe that the seven documents that comprised our corpus of analysis largely respond to the environmental pillar of sustainable development. Thus, we can see references to education for sustainable development in a more traditional perspective, with a greater concern with environmental issues and/or related to biological diversity. It is important to highlight that despite being clear from several documents of political or academic nature that the cultural dimension is included in education for sustainable development (United Nations Educational Scientific and Cultural Organization 2005; Batista 2017; Batista and Andrade 2018), it is not clear or explicit in our corpus how cultural dimension is related to both biological and linguistic dimensions of biocultural diversity. However, it was possible to see that the cultural dimension is very much present in the documents that constitute the corpus of this study, although not through valuing and respecting its diversity.

Thus, references to biocultural diversity are, in fact, scarce, since we have not found clear evidence of the relationships among biological, linguistic, and cultural diversity and their

importance in relation to sustainable development. The analysis carried out allowed us to understand that the documents show a concern with education for diversity and difference and with sustainable development, albeit in an unclear and implicit way. In this sense, knowing that “you can’t care for what you don’t understand, and you can’t easily understand what you don’t already feel emotionally connected to” (Maffi, Paciotti, and Dilts 2014, 20), it seems the documents lack greater attention between the relations of the themes addressed here—biocultural diversity and sustainable development—and it is important to work on concrete educational practices, which is yet to be done.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/Supplementary Material; further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

BB and AA participated in the entire production process of this article.

FUNDING

This study was financially supported by the National Funds through FCT—Fundação para a Ciência e a Tecnologia, I.P. under the project UIDB/00194/2020. This study is developed under a scholarship financed by the National Funds through FCT—Fundação para a Ciência e a Tecnologia, I.P. with the reference SFRH/BD/147769/2019.

REFERENCES

- Azeiteiro, U. M., Bacelar-Nicolau, P., Caetano, F. J. P., and Caetano, S. (2015). Education for Sustainable Development through E-Learning in Higher Education: Experiences from Portugal. *J. Clean. Prod.* 106, 308–319. doi:10.1016/j.jclepro.2014.11.056
- Bardin, L. (1977). *Análise de Conteúdo*. Lisboa: Edições.
- Barth, M., Godemann, J., Rieckmann, M., and Stoltenberg, U. (2007). Developing Key Competencies for Sustainable Development in Higher Education. *Int. J. Sus. Higher Ed.* 8 (4), 416–430. doi:10.1108/14676370710823582
- Batista, B., and Andrade, A. I. (2018). “Educação Para a Diversidade Biocultural e Desenvolvimento Sustentável – Um Elo a Não Perder. *Indagatio Didactica* 10 (1), 99–113. doi:10.22456/1982-0003.85515
- Batista, B. (2017). *Educação Para a Diversidade Biocultural e Desenvolvimento Sustentável Nos Primeiros Anos de Escolaridade*. Aveiro: Universidade de Aveiro.
- Bell, J. (2010). *Como Realizar Um Projecto de Investigação*. edição. Lisboa: gradiva.
- Boff, L. (1990). *Desenvolvimento Sustentável: Crítica Ao Modelo Padrão*. coord. Martins., d’Oliveira, G., Alberto Sousa Gomes, C., Maria Brocardo, J., Pedrosa, J. V., Acosta Carrillo, J. L., Ucha Silva, L. M., et al. (2017). *Perfil Dos Alunos à Saída Da Escolaridade Obrigatória*. Lisboa: Ministério da Educação/Direção-Geral da Educação. Ministério da Educação/Direção-Geral da Educação. available at: http://www.dge.mec.pt/sites/default/files/Curriculo_Projeto_Autonomia_e_Flexibilidade/perfil_dos_alunos.pdf.
- Elands, B. H. M., Vierikko, K., Andersson, E., Fischer, L. K., Gonçalves, P., Haase, D., et al. (2019). Biocultural Diversity: A Novel Concept to Assess Human-Nature Interrelations, Nature Conservation and Stewardship in Cities. *Urban For. Urban Green.* 40 (April), 29–34. doi:10.1016/j.ufug.2018.04.006
- Hanspach, J., Jamila Haider, L., Oteros-Rozas, E., Stahl Olafsson, A., Gulsrud, N. M., Raymond, C. M., et al. (2020). Biocultural Approaches to Sustainability: A Systematic Review of the Scientific Literature. *People Nat.* 2 (3), 643–659. doi:10.1002/pan3.10120
- Harmon, D., and Loh, J. (2010). “The Index of Linguistic Diversity: A New Quantitative Measure of Trends in the Status of the World’s Languages. *Lang. Documentation Conservation* 4, 97–151.
- Instituto Nacional de Estatística (2020). *Objetivos de Desenvolvimento Sustentável – Agenda 2030: Indicadores Para Portugal (2010-2019)*. available at: www.inec.pt/xurl/pub/434725779.
- Juuti, K., Patricia, S., Andrade, A. I., Machado, J., Cristina, S., Jari, L., et al. (2021). Framework for Education for Sustainability: Enhancing Competences in Education.
- Lambrechts, W., Mulà, I., Ceulemans, K., Molderez, I., and Gaeremynck, V. (2013). The Integration of Competences for Sustainable Development in Higher Education: An Analysis of Bachelor Programs in Management. *J. Clean. Prod.* 48, 65–73. doi:10.1016/j.jclepro.2011.12.034

- Loh, J., and Harmon, D. (2014). *Biocultural Diversity: Threatened Species*. Zeist: Endangered LanguagesWWF Netherlands. available at: http://wwf.panda.org/wwf_news/press_releases/?222890/Biocultural-Diversity-Threatened-Species-Endangered-Languages.
- Lozano, R., Barreiro-Gen, M., Lozano, F., and Sammalisto, K. (2019). Teaching Sustainability in European Higher Education Institutions: Assessing the Connections between Competences and Pedagogical Approaches. *Sustainability* 11 (6), 1602–1617. doi:10.3390/su11061602
- L. Maffi and E. Woodley (2010). "What Is Biocultural Diversity?," in *Biocultural Diversity Conservation: A Global Sourcebook* (Washington, DC: earthscan), 3–9.
- Maffi, L. (2001). "Language, Knowledge, and Indigenous Heritage Rights," in *On Biocultural Diversity: Linking Language, Knowledge, and the Environment*. Editor Luisa. Maffi (Washington, DC: Smithsonian Institution Press), 412–432.
- Maffi, L., Paciotto, C., and Dilts, O. (2014). Biocultural Diversity Education: Toward New Ways of Learning and Caring about the Diversity of Life in Nature and Culture. *Langscape* 3 (1), 11–21. available at: <https://terralingua.org/wp-content/uploads/2015/07/BCDEI-Overview.pdf>.
- Merçon, J., Vetter, S., Tengö, M., Cocks, M., Balvanera, P., Rosell, J. A., et al. (2019). From Local Landscapes to International Policy: Contributions of the Biocultural Paradigm to Global Sustainability. *Glob. Sustain.* 2 (May), e7. doi:10.1017/sus.2019.4
- Ministério dos Negócios Estrangeiros (2017). Relatório Nacional Sobre a Implementação Da Agenda 2030 Para O Desenvolvimento Sustentável. 86–88. available at: https://sustainabledevelopment.un.org/content/documents/15766Portugal2017_EN_REV_FINAL_29_06_2017.pdf.
- Monteiro, R., Ucha, L., Alvarez, T., Milagre, C., José Neves, M., Silva, M., et al. (2017). *Estratégia Nacional de Educação Para a Cidadania*. Lisboa: Ministério da Educação.
- Oliveira, J. A. d. (2020). *Educação Para o Desenvolvimento de Competências Em Sustentabilidade Na Formação de Professores e Alunos Do Ensino Fundamental*. Aveiro: " University of Aveiro. doi:10.36229/978-65-86127-57-7.cap.09
- Organização para a Cooperação e Desenvolvimento Económico (2001). La Definición y Selección de Competencias Clave - Resumen Ejecutivo. N.D. available at: <https://www.deseco.ch/bfs/deseeco/en/index/03/02.parsys.78532.downloadList.94248.DownloadFile.tmp/2005.dscexecutivesummary.sp.pdf>.
- Poole, A. K. (2018). Where Is Goal 18? The Need for Biocultural Heritage in the Sustainable Development Goals. *Environ. Values* 27 (1), 55–80. doi:10.3197/096327118X15144698637522
- Posey, D. (1999). *Cultural and Spiritual Values of Biodiversity*. 1st ed. Nairobi: United Nations Environment Programme. doi:10.3362/9781780445434.014
- Raygorodetsky, G. (2014). The World We Want: Ensuring Our Collective Bioculturally Resilient Future. *Biocultural Divers. Toolkit: Introduction Biocultural Divers.* 1, 32–40. available at: https://terralingua.org/wp-content/uploads/2018/09/Biocultural-Diversity-Toolkit_vol-1.pdf.
- Redclift, M. (2018). Sustainable Development in the Age of Contradictions. *Dev. Change* 49 (3), 695–707. doi:10.1111/dech.12394
- Rieckmann, M. (2012). Future-oriented Higher Education: Which Key Competencies Should Be Fostered through university Teaching and Learning? *Futures* 44 (44), 127–135. doi:10.1016/j.futures.2011.09.005
- Skutnabb-Kangas, T., Maffi, L., and Harmon, D. (2003). *Compartir Un Mundo de Diferencias - La Diversidade Lingüística, Cultural y Biológica de La Tierra*. Barcelona: UNESCO. Barcelona: Linguapax, Unescoat. available at: <http://www.linguapax.org/wp-content/uploads/2015/03/Compartir-un-mundo-de-diferencias.pdf>.
- Solís, M. Á. U. (2014). Competencias Para La Sostenibilidad Y Competencias En Educación Para La Sostenibilidad En La Educación Superior. *Uni-Pluri/Versidad* 14 (3), 46–58.
- Sterling, E. J., Filardi, C., Toomey, A., Sigouin, A., Betley, E., Gazit, N., et al. (2017). Biocultural Approaches to Well-Being and Sustainability Indicators across Scales. *Nat. Ecol. Evol.* 1 (12), 1798–1806. doi:10.1038/s41559-017-0349-6
- Toledo, Víctor. M., and Barrera-Bassols, Narciso. (2008). *La Memoria Biocultural: La Importancia Ecológica de Las Sabidurías Tradicionales*. Barcelona: Icaria editorial. available at: <https://www.socla.co/wp-content/uploads/2014/memoria-biocultural.pdf%5Cnhttp://www.unich.edu.mx/wp-content/uploads/2013/09/Art.-Notas-a-la-Memoria-Biocultural-de-Victor-Toledo.pdf>.
- Toledo, V. M., Barrera-Bassols, N., and Boege, E. (2019). *¿Qué Es La Diversidad Biocultural?* 1a ed. México: Universidad Nacional Autónoma de México. available at: https://www.researchgate.net/publication/337387343_Que_es_la_Diversidad_Biocultural.
- Torres, A., Figueiredo, I. L., Cardoso, J., Pereira, L. T., Neves, M. J., and Silva, R. (2016). *Referencial de Educação Para o Desenvolvimento - Educação Pré-Escolar, Ensino Básico e Ensino Secundário*. Lisboa: Ministério da Educação.
- United Nations Educational Scientific and Cultural Organization (2005). *Década Das Nações Unidas Da Educação Para o Desenvolvimento Sustentável, 2005–2014: Documento Final Do Esquema Internacional de Implementação*. Brasília. available at: <https://www.unijales.edu.br/library/downebook/id>.
- United Nations Educational Scientific and Cultural Organization (2017). *Educação Para Os Objetivos de Desenvolvimento Sustentável: Objetivos de Aprendizagem*. Brasil: UNESCO.
- United Nations (2015). *Transforming Our World: The 2030 Agenda for Sustainable Development*. New York: United Nations. available at: <http://www.crcnetbase.com/doi/10.1201/b20466-7>.
- United Nations (1995). "Agenda 21." Brasília: Centro de Documentação e Infonnação Coordenação de Publicações. available at: <http://bd.camara.gov.br/bd/handle/bdcamara/7706>.
- Wiek, A., Bernstein, M. J., Foley, R. W., Cohen, M., Forrest, N., Kuzdas, C., et al. (2016). "Operationalising Competencies in Higher Education for Sustainable Development," in *Routledge Handbook of Higher Education for Sustainable Development*. Editors I. Thomas, M. Barth, G. Michelsen, and M. Rieckmann (London and New York: Routledge), 241–260. available at: <https://doi.org/10.1080/17513758.2016.116250110132-6>.
- Wiek, A., Withycombe, L., and Redman, C. L. (2011). Key Competencies in Sustainability: A Reference Framework for Academic Program Development. *Sustain. Sci.* 6, 203–218. available at: <https://link.springer.com/content/pdf/10.1007/s11625-011-0132-6.pdf>. doi:10.1007/s11625-011-0132-6
- World Commission on Environment and Development (1987). *Our Common Future*. Oxford/New York: Oxford University Press.
- Maffi, L. (2012). *Biocultural Diversity and Sustainability*. The SAGE Handbook of Environment and Society, 267–278. doi:10.4135/9781848607873.n18

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Copyright © 2021 Batista and Andrade. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.