

Experiential environmental knowledge: fundamentals and contributions to research/initial teacher training on environmental education¹

ABSTRACT

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The present study focuses on the concept of “**Experiential Environmental Knowledge**,” which emerges from the intersection between Environmental Knowledge and Experiential Knowledge. We discuss its relevance in the research and initial teacher training processes in Environmental Education based on the theoretical contributions by Enrique Leff, Marie-Christine Josso, and other authors. We explored the concept in its theoretical-epistemological and methodological dimensions seeking to offer an in-depth understanding of its potential for research and training activities focusing on the relationship between teaching and sustainability. From a doctorate thesis in Education, we analyze possibilities to integrate environmental knowledge with (auto)biographical production exercises into research and teacher training practices. We identified characteristics that shed light onto the ontological and axiological dimensions of the concept, especially concerning to ethics, environmental justice, and the notions of “existing,” “being,” and “intervening” in the world. This approach reveals the complexity of life practices and training of the subjects, stimulating a university practice committed to environmental training and the continuity of studies on Environmental Education. Moreover, it calls on future teachers to take on the global responsibility of building sustainable, ethical, and fair societies, promoting reflections on the values and actions required to face current socioenvironmental challenges.

KEYWORDS: teaching; environment; story narration; teacher knowledge; sustainability.

Saber ambiental experiencial: fundamentos e contribuições à pesquisa/formação inicial de professores em educação ambiental

RESUMO

Este trabalho enfoca o conceito de **“Saber Ambiental Experiencial”**, que emerge da interseção entre o Saber Ambiental e o Saber Experiencial. Discutimos sua relevância nos processos de pesquisa e na formação inicial de professores em Educação Ambiental com base nas contribuições teóricas de Enrique Leff, Marie-Christine Josso e outros autores. Exploramos o conceito em suas dimensões teórico-epistemológica e metodológica, buscando oferecer uma compreensão aprofundada de seu potencial para pesquisas e atividades formativas focadas na relação entre docência e sustentabilidade. A partir de uma tese de doutorado em Educação, analisamos possibilidades de integrar o conhecimento ambiental com exercícios de produção (auto)biográfica em práticas de pesquisa e formação docente. Identificamos características que evidenciam as dimensões ontológica e axiológica desse conceito, especialmente no que se refere à ética, à justiça ambiental e às noções de “ser”, “estar” e “intervir” no mundo. Essa abordagem desvela a complexidade das práticas de vida e formação dos sujeitos, estimulando uma prática universitária comprometida com a formação ambiental e a continuidade dos estudos sobre Educação Ambiental. Além disso, convoca futuros professores a assumir a responsabilidade global de construir sociedades sustentáveis, éticas e justas, promovendo reflexões sobre os valores e as ações necessários para enfrentar os desafios socioambientais contemporâneos.

PALAVRAS-CHAVE: docência; meio ambiente; narração de histórias; saberes do docente; sustentabilidade.

INTRODUCTION

Countless present-day social and ecological challenges leave no doubt regarding the unsustainability of the lifestyle in the current era. Uncertainties in the life of planet Earth make increasingly evident the certainty that common goals, at smaller and larger scales in the world, involve the protection of nature, the investment in sustainable cultures. Education plays a key role in this process, especially when considering the effect of teacher action towards social (re)construction. Environmental Education is a space reserved for the discussion about environmental sustainability, which enables contributing to the development of a new conduct critical of socioenvironmental, political, and cultural issues. We work with values, ways of existing, being, and intervening in the world with the intention of preventing the annihilation of biodiversity, of life, the intensification of ecological imbalance and of social inequalities.

We bet on an educational philosophy that aims to overcome the issues deriving from the fragmented acquisition of knowledge, which compromises the development of global, contextualized visions able to conceive life, knowledge, people, and the world in its inherent complexity (Morin, 2011). Pertinent knowledge involves ethics of “planetary” dimensions, an “earthly” identity, i.e., a sense of life on a large scale, a life philosophy, and existence that does not disregard humans and their rationality when discussing the (trans)formation of the environment. In this realm, education must promote notions on the common fate shared between human beings in the world, which involves the idea that our life histories are intimately related with environmental history, seen as the environmental crisis is associated with a value crisis (Souza & Cavalari, 2020).

That said, we assume Environmental Knowledge as the central object of the present study, based mainly on Enrique Leff. When reviewing the expression of the concept in the academic and scientific literature², we identify its approach articulated with different themes, with the discussion on its promotion in the context of initial teacher training in Environmental Education in particular drawing our interest. Further ahead, we will enable the detailed comprehension of such process. For the time being, we highlight the lack of an experiential approach associated with Environmental Knowledge and, therefore, our interest in discussing it from the perspective of (auto)biographical work with life experiences. Such approximation, with Experiential Knowledge, is conducted under the light of Marie-Christine Josso. Thus, in this paper we are focused on clarifying the theoretical-epistemological and methodological bases of Environmental Knowledge and Experiential Knowledge, about which we highlight epistemological traits, paradigms, and characteristic approaches of those concepts. The entire discussion culminates in the emergence of “Experiential Environmental Knowledge,” a concept that favors a keen eye on space and time from the work centered around stories/life experiences and environmental knowledge in the initial training of teachers.

To that end, we hereby intend to answer the following question: Which theoretical-epistemological and methodological elements characterize Experiential Environmental Knowledge and enable understanding it as a pathway of research and initial teacher training in Environmental Education? With that in mind, we establish the overall goal of promoting the understanding of

Environmental Knowledge and Experiential Knowledge as independent and related concepts, as well as of Experiential Environmental Knowledge as a construct resulting from such theoretical intersection and executable from an empirical standpoint. Under such optics, we delineate theoretical-epistemological and methodological aspects of Environmental Knowledge and Experiential Knowledge and analyze the intersection between those concepts, especially theoretical-epistemological and methodological aspects, and discuss Experiential Environmental Knowledge as a construct that contributes towards research and initial teacher training in Environmental Education.

We seek to elucidate the concepts of Environmental Knowledge and Experiential Knowledge based on the thoughts by Enrique Leff and Marie-Christine Josso, respectively. At first, we suppose that Environmental Knowledge, when dealt with at the interface of life experiences, mobilizes processes of initial teacher training in Environmental Education. Such hypothesis was confirmed when analyzing the results of research-training defended as a doctorate thesis on Education carried out by a group of undergraduate students in Pedagogy at the University of the State of Minas Gerais. With that in sight, we present in the current text the results regarding the study of Environmental Knowledge, about which we propose the integration of the “experiential” dimension in its meaning.

Experiential Environmental Knowledge, being the result of the intersection between Environmental Knowledge and Experiential Knowledge, has as main objective the link established between the environment and life experiences. When elaborated, analyzed, and interpreted, those weaves (life stories and lived experiences), lessons, and learnings can be extracted and allow mobilizing investigative and formative activities. In this sense, Experiential Environmental Knowledge mobilized the “(experiences of) (environmental) life-knowledge.” We favor the communication of the theoretical-epistemological and methodological dimensions of Experiential Environmental Knowledge, supported by the thesis that *Environmental Knowledge, when built based on the biographical work with life experiences centered around initial teacher training in Environmental Education, contributes to the knowledge and comprehension of the natural and sociocultural reality in its complexity.*

Next, we will discuss issues related to human life and rationality, enabling reflections on the axiological and ontological aspects of Experiential Environmental Knowledge.

METHODOLOGICAL PATH

The present study consists of a theoretical paper of a qualitative approach in which we explore and describe the theoretical-epistemological and methodological dimensions of Experiential Environmental Knowledge under the light of results achieved during a doctorate in Education³. In this thesis, we employed the (auto)biographical method articulated with the creation of training memories, taking into account the work carried out with undergraduate students in Pedagogy at the University of the State of Minas Gerais and based on which we analyze, via (auto)biographical work, the experiences related with Environmental Education, with Environmental Knowledge. The researcher/analyst, in this experience, participated and narrated his life and training story, being positioned

as a mediator member of the group. The creation and analysis of memorials were carried out in the year 2023, with the research being approved by the Committee of Research Ethics on Human Beings of the Federal University of Espírito Santo under consolidated opinion no. 6,220,556, on August 4th, 2023.

The excerpt transposed to this manuscript refers to the study of Environmental Knowledge and the proposition of the experiential dimension as a category that articulates the construction of environmental knowledge and elicits investigative and formative practices in the field of teaching. Under the optics of initial teacher training in Environmental Education, we revise the expression of Environmental Knowledge in the academic and scientific literature (Del Mônico, 2005; Gouvêa, 2006; Tozoni-Reis, 2007; Guimarães, 2010; Rodrigues, 2011; Rocha, 2013; Tavares Júnior & Cunha, 2015; Eschenhagen, 2016; Quinteiro, 2017; Silva, 2017; Silva, 2018; Viana, 2017; Guimarães, 2018; Viana & Ferreira, 2018; Konflanz, 2020; Martinelli, 2020). We identified the lack of studies related to the experiential approach and, hence, lean on the theories by Marie-Christine Josso and Enrique Leff. From the dialog established between the authors, we conjecture Experiential Environmental Knowledge and, as a result of such process, we discuss theoretical-epistemological and methodological traits through which we shed light onto its axiological (values – justice, ethics, etc.) and ontological (*existing*, *being*, and *intervening* in the world), typical of theories that lay basis for its signification.

We take into consideration what Martins and Lavoura (2018) propose about theoretical-conceptual research and the selection of a certain collection, to be analyzed and substantiated, considering the need to delimit an issue, a justification, and hypothesis. The authors suggest there is: I) specification of the meaning of the concepts presented in the works, as well as of their correlations; II) identification of the directive idea(s), i.e., of the relationships between assertions and explanatory ideas (reasons) presented by the authors; III) differentiation and comparative analysis of the directive ideas between each other, determining the importance of each; IV) synthesis operation, i.e., rational integration of the data discovered, considering the material analyzed and the issue announced. In this optics, we: (i) explain the meanings of Environmental Knowledge and Experiential Knowledge, both individually and correlating them; (ii) identify the ideas by Enrique Leff and Marie-Christine Josso key to the comprehension of Environmental Knowledge and Experiential Knowledge, respectively; (iii) propose Experiential Environmental Knowledge as an emerging concept of the intersection between Environmental Knowledge and Experiential Knowledge. We place this discussion in the context of research and initial teacher training in Environmental Education, based on the thoughts by Enrique Leff (2003, 2007, 2009, 2012, 2015, 2019) and Marie-Christine Josso (2004, 2007, 2009, 2020), as well as resort to Abrahão (2011), Morin (2011), and Eschenhagen (2016), among other authors. We present the theoretical-epistemological and methodological bases that support Environmental Knowledge and Experiential Knowledge and, from that, propose Experiential Environmental Knowledge resulting from the theoretical and empirically executable intersection.

ENVIRONMENTAL KNOWLEDGE

We approach Environmental Knowledge at the interface of Environmental Education and, with that, discuss it in the context of initial teacher training in Environmental Education. The following concepts will arise over the reading of this text: environment, environmental complexity, environmental rationality, and sustainability, among others. Understanding them individually, as well as in their inter-relations, will allow the readers to meander through what we consider to be the “matrix, theory, and epistemology guideline” of Environmental Knowledge.

Environmental Knowledge, at the conceptual level, is acknowledged in its dynamic character, usually based on the idea that fragmented knowledge implies a reduced view of being, of knowing, of the world. Therefore, in contrast with that, it is founded on an epistemology whose object is the environment (Leff, 2012). Environmental Knowledge opens doors to a new social, economic, scientific, educational, human perspective. Understanding it assumes the development of a thought, of a rationality that values and respects the singularities of the subjects, of the cultures, and that accepts diverse forms of existence, seeking to instate relationships (among humans and between those with nature) seated on the paradigm of sustainability and conceived in complexity.

Environmental Knowledge emerges from a reflection on the social construction of the current world, where today the historical times converge and precipitate that are not anymore cosmic times, of biological evolution, or of historical transcendence. It is the confluence of physical, biological, and symbolic processes reconducted by the intervention of man – of the economy, of science, and of technology – towards a new geophysical order, of life, and of culture (Leff, 2015, p. 9).

We must know and understand the environment in its complexity, as well as the interactions and the spaces of power that, in a diffuse amalgamation delimited by everyday relations, contribute to a socioenvironmental dynamic and the constant transformations of the world (Leff, 2015, 2019). Such complexity is delimited by the amalgam involving nature, technology, and textuality, holding in this scenario philosophical reflections and cultural identities that survive and take on a new meaning, amidst the development of cybernetics, of electronic communication, of biotechnology, in times of hybridization of the world (Leff, 2015). Environmental Knowledge is forged in these times, being associated with the idea of “environmental rationality,” which can be understood as a concept that

[...] Integrates ethical principles, material bases, technical and judicial instruments, and the action oriented towards the democratic and sustainable management of development; in turn, it is converted into a normative concept to analyze the consistency of the principles of environmentalism in its theoretical and ideological formations, of institutional transformations and governmental programs, as well as of social movements, to reach those goals [...] the category of environmental rationality works as a heuristic concept that guides and promotes the praxeology of environmentalism and that, as the same time, allows analyzing the efficacy of processes and their “environmentalist” actions (Leff, 2015, p. 135).

The integral development of environmental rationality assumes its mobilization in four different dimensions: (I) substantive rationality; (II) theoretical rationality; (III) instrumental rationality; (IV) cultural rationality. Those can be

understood, respectively, as: (I) An axiological system that defines values and objectives and seeks to guide social actions and establish a new paradigm of development bound by ethical and theoretical principles; (II) The systematization of the values mobilized in the substantive rationality, based on materials processes and serving as support for the reconstruction of reality, articulating with processes of ecological, cultural, technological, political, and economic order; (III) A pathway to reach the intended sustainable goals, which create technical, functional, and operational links between social objectives and materials bases of development, involving the creation of effective instruments for the implementation of environmental management projects; (IV) A unique and diverse system, not submitted to homogenizing and reductive logic, but which, on the contrary, integrates different ethnic groups and socioeconomic backgrounds, which produces the identity and integrity of each culture, which foresees the work with the potentialities of the environment where the communities are inserted and the participation in the perception, management, and handling of resources (Leff, 2014, 2015).

Environmental Knowledge is defined by the integration of ways of thinking and acting based on sustainability; its implications cause impact at the material and symbolic level, enabling social and environmental aspirations and constructions that overcome the market logic responsible for the unbridled exploitation of nature, the transformation of environmental resources into capitalized products driven by consumerist habits, among other issues that challenge humanity, the introduction and permanence of products and practices in daily dynamics of individual and collective character.

In the Brazilian context, we can consider the National Environmental Education Policy (Brasil, 1999) as a landmark of the essentiality of the environmental dimension in educational curricula as it involves the formation of values during technical-professional and human development. Other examples of national policies that guide towards sustainability are: The Fauna Protection Law (Brasil, 1967), the National Environment Policy (Brasil, 1981), the National Water Resources Policy (Brasil, 1997), and The National Solid Waste Policy (Brasil, 2010), in addition to countless other legal documents and texts that lay norms for and/or direct the political and social development of the nation. However, despite the emergence of Environmental Education, particularly as a scientific field, we must take into account the countless challenges that exist to promote it (Reigota, 2012).

In our understanding, the development of formative processes seated on values related to sustainability is an important path essential for the construction of fairer societies and more ecologically balanced environments. The environmental rationality mentioned by Leff (2014) will only effectively contribute to the social reappropriation of nature if there is a collective engagement on sustainability, on shared responsibility, which, if materialized, tends to implicate the current socioeconomic order and global dynamics. A key challenge for the promotion of sustainability is the issue of “human-human” and “human-nature” relationships.

To Freire (1967, p. 39),

The concept of relationships, from the purely human sphere, holds in itself, as we shall see, connotations of plurality, of transcendence, of criticality, of consequence, and of

temporality. The relationships man establishes in the world with the world (personal, impersonal, corporeal, and incorporeal) hold a certain order of characteristics that sets them fully apart from sheer contacts, typical of the other animal sphere. We understand that, for man, the world is an objective reality, irrespective of him, liable to being known. It is crucial, however, that we assume that man, a being of relationships and not only of contacts, is not only *in* the world, but *with* the world. Being *with* the world leads to him being open to reality, which makes him be the being he is.

Inspired by that definition, we bet on Environmental Education as a theoretical and practical pathway able to reorient human relations, whose acquisition as a life philosophy (Tristão, 2013) potentiates the conception of Environmental Knowledge hereby discussed. The ontological dimension and the importance of a dialog of the knowledge seated on a political ethics of life are typical issues of Environmental Knowledge (Leff, 2019). We notice the need to establish an “ethics of relationships.” And even if, at first, such expression seems redundant, the relational dimension seems to us an element whose textual emphasis is needed, calling attention to the presence of another rationality to be developed. The construction of Environmental Knowledge in training processes elicits the establishment of values, with environmental justice able to be considered one of those values, in its role of respecting the right to life, for an ecologically balanced environment and that, to reach such status, requires collective effort, socially widespread attitudes and practices (Leff, 2001).

Environmental ethics and justice are values hereby defined as essential to the training process in Environmental Education and guiding of the teaching activity. This way, the effective construction of Environmental Knowledge also requires taking into account one of its essential bases, environmental epistemology, which is associated with the idea of environmental hermeneutics and of interpretation exercise guided by knowledge whose foundation is the complex notion of the environment, of the being, of reality (Leff, 2012). One must value the beings, the knowledge, nature, the environment, while understanding that, although there are differences between cultures, those must not take precedence over the principle of sustainability. It’s also important to have cooperative work towards overcoming present-day socioenvironmental challenges, which point to the unsustainability of our culture and demonstrate the harm related to the scarcity of resources and basic living conditions and the survival of living beings.

We are called upon for new knowledge, a new way of thinking and acting, of doing science and technology, of promoting economy. We are called upon for the construction of sustainable societies and cultures. We require a critical theory of production and of sustainable development, based on the paradigm of sustainability, one that enables a new north of daily processes and practices, contributing from the standpoint of reappropriation of nature, of the creation of ethical and fair societies (Leff, 2014, 2015). Understanding this inherently complex scenario requires the creation of notions on the environment, which, in its acknowledged dynamicity, comprises a complex network of occurrences, of events over which human beings play a major role and hold significant responsibility (Leff, 2003). The relationship between society and nature, the implications of technologies on the daily maintenance of life, and the unsustainable character of cultures, for instance, are issues that show that, for better understanding of Environmental Knowledge, it is important to take into account the

multidimensional character of being, of knowing, of reality. Hence the importance of creating adequate notions on the environment and environmental complexity.

The environment is not only the *outside* world, the surroundings of the being, or that which remains alien to a system. The environment is knowledge on externalized nature, on identities lacking a territory, about the actual denial and knowledge subjugated by totalitarian reason, the unifying *logos*, the universal law, the homogenizing globality, and generalized ecology. The environment is the objectivity and subjectivity, exteriority and interiority, imperfection in being and imperfection in knowing, which does not amass any objective knowledge, a systemic method and a totalitarian doctrine. The environment is not only a complex object, but one integrated by multiple identities that make up a new rationality, which welcomes diverse cultural rationalities and gives way to different life worlds (Leff, 2009, p. 21).

The hybridization between the symbolic and real dimensions is required to conceptually understand the environment in order to build appropriate conceptions to what is assumed about multidimensionality (empirically expressed and theoretically reflected and communicated). That occurs because environmental complexity “[...] emerges from the hybridization of several materials and symbolic orders that, for being determined by scientific and economic rationality, engendered this objectified and thingified world that becomes resistant to all knowledge” (Leff, 2007, p. 14). Thinking and conceiving the environment in its complexity is immobilizing it in face of knowledge open to existential possibilities, not limiting it to one or another form of scientific, theoretical, or cultural manifestation that reduces it and mischaracterizes beings and their cultural practices.

For some time, Morin (2011) has warned us about the need to promote relevant knowledge so that we overcome fragmented, reductive visions and thoughts unable to encompass the complexity of knowledge, of life, of the world, as well as of the very human identity. We need to develop our humanity, which involves, in the case of Environmental Education, the quest for the naturalization of sustainable thoughts and actions and the denaturalization of social and environmental inequalities and injustices. Building Environmental Knowledge is to associate it with the idea of impermanence, of uncertainty of socioenvironmental conditions, which requires from societies constant diligence engaged with the demands of climate, of waters, forests, urban and rural spaces, and, overall, human relations, among other matters.

To Pitanga (2015), the propositions by Enrique Leff represent an epistemological support in establishing man-nature and man-man relationships, and a methodological support regarding the production of knowledge. Promoting them, according to that author, enables the construction of a new societal model, not anymore marked by the production-consumption relationship or by the need of building a new production world, but rather focused on the production of a new world with a happier, more humane, ecologically sustainable, socially egalitarian society. At present, it only takes watching the news, the means of communication (especially in virtual environments) to find reports on the risks and fears that surround daily life (at the level of public safety, health, environment, etc.). We quickly realize the insufficiency of methods of production, consumption, and social

and environmental development, as well as their implications on the conditions for maintaining life on planet Earth.

A deeper understanding of Environmental Knowledge, as aforementioned, requires lending attention to its epistemological basis. According to Leff (2012, 2015), environmental epistemology consists in the confluence of materialist epistemology and of critical thinking with the environmental issue, resulting in epistemological thought whose central object is the environment and that leads to an exploratory path not reduced to the limits of economic, productive, and scientific rationality. The quest is for the construction of an adequate concept of environment, albeit not static, as well as the definition of corresponding knowledge. About this process of production and understanding of Environmental Knowledge, we point to the importance of Environmental Education as a training pathway that, simultaneously, cooperates towards promoting the sustainability and development of environmental rationality.

Environmental Knowledge is part of rational knowledge and sensitive knowledge, allowing the restoration of the relationship between life and knowledge (Leff, 2009). An issue of the disjunction between life and knowledge that needs to be overcome and is associated (at the epistemological and practical levels) with countless challenges arising from unsustainable cultural practices. Such disjunction prevents the construction of relevant knowledge and harms teaching systems since, associated with the fragmented character of sciences in their hyperspecialized subject matters, prevent the development of complex notions contextualized around beings and knowledge (Morin, 2011). Restoring the life-knowledge link is also an objective of Environmental Education given what is laid in the Environmental Education Treaty for Sustainable Societies and Global Responsibility, which is defined as the process of permanent learning focused on the construction of fair, ecologically balanced societies guided by the respect to life and taking into account the interdependence and diversity between cultures, from the local to the planetary level (Neiman, 2023). For such restoration, we wager that the construction and comprehension of Environmental Knowledge in research process and practices and training in Environmental Education prove an important pathway in the quest for sustainability.

Five main orbits theoretically define Environmental Knowledge at the epistemological level:

1. The **epistemological strategy to think the articulation of sciences** in face of the totalization of knowledge via system theory, an interdisciplinary method and a thought of complexity;
2. The **exteriorization of environmental knowledge** from the realm of sciences to the strategies of power in knowledge that play on the discursive field of sustainability;
3. The **construction of environmental rationality**, which rearticulates the real and the symbolic, thought with social action, transcending structural determinations and opening universal rationality to a plurality of cultural rationalities;
4. The **formation of environmental knowledge** and the **emergence of environmental complexity**;
5. The **reemergence of being**, the **reinvention of identities**, and the **ethics of diversity**, which give way to a sustainable future through a dialog of knowledge, within a policy of

diversity and of difference that transcends the interdisciplinary project. (Leff, 2012, p. 27-28, our highlight).

Environmental Knowledge imposes the renovation of a simplistic and reductionist vision towards a broader complex vision. What Leff (2014) emphasizes is that the social and environmental crisis at hand is, in essence, a crisis of reason, of knowledge, of human rationality, which, in order to be overcome, requires we establish a new social, economic, political, and cultural order in which sustainability is the paradigm of processes and productive practices. Such perspective leads us to reflect on the role of education and, in particular, of the university on human formation and its environmental implications. The socioenvironmental nature of teaching seems to us an argument that, undeniable, portrays the relevance of mobilizing the sustainability-teaching link in teacher training courses. We conceive the space/time of initial teacher training as fertile grounds for work in the field of Environmental Education, able to contribute to the development of environmental rationality, whereas the construction of Environmental Knowledge corroborates the critical thinking targeting the construction of sustainable societies.

To Eschenhagen (2016), it is the role of universities to shed light onto the unsustainable scenario established. A crisis scenario that, to Pitanga (2015), is characterized by the relentless rhythm of contemporary life, organized under the logic of the produce-buy-profit triad that is responsible for the socioenvironmental impacts and harm under discussion. We corroborate those perspectives, understanding universities as a privileged space that, for being responsible for the initiation in the labor of teaching, also allow instructing teachers regarding sustainability. We see in this context a promising opportunity to promote the engagement between beings and diverse knowledge, whose established interactions are potentially useful to revealing the environmental complexity, seen as different life and knowledge nuances are possible in heterogeneous groups of students, which allows the theoretical and practical mobilization of values associated with sustainability guided by several optics.

Environmental Knowledge presents as a key alternative able to reorient social processes and practices, the meanings of life and the world, calling upon us to an exercise of knowledge and comprehension of the environmental and sociocultural reality, stimulating the critique of the current lifestyle and its predatory implications. Such knowledge invites us to create and adopt sustainable strategies not dissociated from the complex notion of beings and knowledge, of identities and of the different forms of existing that make up the amalgam comprising materials and symbolic elements. It consists in a policy of valuing life, of diversity, and of difference based on ethics and justice, besides being a pathway for the restoration of the relationship between life and knowledge, thus enabling dialogs between different beings and knowledge part of new ways of thinking and making cultures. Being sustainable implicates setting a collective existential horizon that is concerned with the modes of “existing,” “being,” and “intervening” in the world. It allows the link between life and knowledge to be mobilized in an educational process targeting a philosophy of valuing life and environmental protection. That allows us, in succession, to approach the fundamentals of Experiential Knowledge, highlighting its confluence with Environmental Knowledge and leading to the understanding of Experiential Environmental Knowledge.

EXPERIENTIAL KNOWLEDGE

We hereby present Experiential Knowledge and its theoretical-epistemological and methodological dimensions. Its definition involves understanding some terms, such as: life stories and experiences, training memorial, (auto)biographical narratives, and research-training, among others. To start, we point to the convergence of both types of knowledge in what is referred to as the “life-knowledge” link.

In recent decades, Marie-Christine Josso (2004, 2007, 2009, 2020) has produced a hefty theoretical and practical framework targeting work with life stories and experiences in processes and practices of research and training, including in teaching. We acknowledge how precious her work is and herein adopt the “Experiential Knowledge” concept as a way of communicating the exercise of (auto)biographical narrative production, in group dynamics, involving activities of reflective, dialogic, and interpretative character, which contribute to the development of an investigative and formative dynamic characterized by the generation of (self)knowledge, production of senses, (re)signification of experiences and learnings extracted from the contact established by the narrators with themselves and with others.

Experiential Knowledge is associated with a theoretical and practical exercise that cooperates towards the personal and professional development of subjects, enabling the mobilization of (self)knowledge from the analysis/interpretation of life stories/experiences, through what we can call “biographical work” (Josso, 2004, 2020). Biographical work stimulates the reflection on how we conduct (or how we allow ourselves to be conducted) through the pathways of life, of training, of the profession, contributing to (trans)formations and the development of “knowing” and “knowing-doing.” In the case of the teaching-sustainability link, processes and practices of teacher training and action are (re)oriented under the light of (re)significations and senses produced on the experiences, of oneself or others, related to Environmental Knowledge and Environmental Education.

About experiences, in general, it is important we keep in mind those differ from what is understood as “life experiences.” According to Josso (2004, 2020), our life trajectories are made up of several experiences, termed “recollections-references.” Nonetheless, not all recollections-references are life experiences. One way of telling them apart is to consider how much a given experience impacts us, how it (trans)forms more or less our way of being, of acting personally or professionally. Therefore, it is correct to state that

[...] those events reach the status of experiences from the moment we do some reflective work over what has happened and over what was observed, noticed, and felt” (Josso, 2004, p. 43). This processual-practical dynamic enables “walking for oneself” and is what guides biographical work and activities of the “research-training” kind.

[...] That is how our individual and collective memory fragments turn into resources, into fertilizers, into inspiration so that our imaginary of ourselves is able to invent this indispensable continuity between the present and the future, thanks to a retrospective look at our-selves. It will not be excessive to comment that biographical work is not to repeat stories of the past, but their partial resumption, in putting them in a present and future perspective, thanks to that retrospective look, on the one hand, and, on the other, due to the fact each happening or singular context immediately remits us to (sociocultural

and sociohistorical) collective references, whether or not we are aware of that. (Josso, 2007, p. 435).

Research-training involves the articulated notion of investigative processes that, taking into account the reflective, narrative, and interpretative exercise mobilized, are also admitted as training processes. That is because “between an event and its signification, the process of making sense of what happened or of what is happening intervenes. The experience [...] constitutes this relationship between what happens to us and the meaning we attribute to what affected us” (Passeggi, 2011, p. 149). Knowing the experience bears relation with the issue of “[...] existence, with the singular and concrete life of a singular and concrete being. The experience, and the knowledge derived from it, are what allows us to appropriate our own lives” (Bondía, 2002, p. 27). The (auto)biographical narrative production allows, therefore, evoking recollections-references that, when submitted to analytical and interpretative reflective exercises, potentially conduce to personal, social, and professional (re)orientation. Not by chance, Experiential Knowledge is founded on the epistemology of subjects and on the singular-plural paradigm, cooperating in the fields of research and training (Josso, 2004, 2020) and about which we highlight their pertinence in mobilizing investigative and formative processes.

Practices with live experiences and training are based on the singular-plural paradigm, which assumes the conception of diverse, singular beings recognized in their particularities, but that, at the same time, paradoxically, make up a plural collective comprising a diversity of singularities. We mean the human collective. Thus, by projecting the confluence of diverse, singular beings, we establish the idea of valuing life and its singular ways of expression, concomitantly with the idea of beings belonging to a collective that, as it comprises a set of singularities, culminates in a plurality of ways of existing and being in the world (Josso, 2004). That allows characterizing human beings in their social dimension, as a plural collective established on singularities. The notion of diversity and difference, as well as in Environmental Knowledge, guides the intrinsic world conception of Experiential Knowledge, especially if our psychosomatic nature is considered.

The research work from the narration of life stories or, better yet, of stories centered around training, carried out under the perspective of evidencing and questioning heritages, continuity, and rupture, life projects, multiple resources connected to acquiring experience, etc., this work of reflection from the narrative of training oneself (thinking, becoming sensitized, imagining, feeling emotions, appreciating, loving) allows establishing the measure of social and cultural mutations in singular lives and relating them with the evolution of professional and social life contexts. The subjectivities expressed are confronted with their frequent inadequacy to a freeing understanding of creativity in our mutating contexts. The work on that singular and plural subjectivity becomes one of the priorities of training in general and of the work of narrating life stories in particular (Josso, 2007, p. 414-415).

Since social and cultural mutations (noticed under the optics of life stories in their singularities) are related to evolution of trajectories (personal, professional, social), we can state that, also in the space/time of initial teacher training, at universities, elements describing environmental complexity are present, here understood as powerful when associated with the exercise of revealing

environmental complexity, from the construction of Environmental Knowledge. We set collectivity as a fundamental principle for reflections on life in the world. Human relations are learned from the perspective of dynamics that directly impact society and nature, i.e., that impact society conditions of any context. Thus, when discussing the constant transformations in the world, which Leff (2015) refers to, we are directly and indirectly linked by materials and symbolic elements that make up daily scenarios in which the stories/experiences mentioned by Josso (2004, 2020) are build.

From the methodological standpoint, Josso (2004) foresees the flexibility of research-training and adaptation of biographical work, which in this paper involves taking into account biographical work from the perspective of employing memorials as instruments of research and training. We deal with a processual-practical dynamic whose development takes place in groups and that is configured as a formative experience for the subjects who take part in them, i.e., we consider the implications of the processu at the level of (self)knowledge. The training memorial comprises

[...] **the process** and the **result of reminiscing with reflection over facts reported**, orally and/or written, in face of a **life narrative**, whose thread (plot) **makes sense** for the subject of the narration, with the **goal**, as long as there is always intentionality, of clarifying and **resignifying** aspects, dimensions, and moments of training oneself. With regards to the process, it is about **experiencing** the moment of the narrative reflected upon as also an **essential formative component**. It is about the narrators, the creator of their own memorial, actually being **the subjects of the narration** (although also being its object), aware that the reflection carried out is a *sine qua non* element for **understanding their own training** and, moreover, that **the moment of narration**, under the bounds hereby understood, is, in itself, **a formative moment**. (Abrahão, 2011, p. 166).

The narrator is the subject of the narration and the object of the narrative. That dynamic involves an initial agreement with the group, followed by individual narrative production; narrative at the socialization level; comprehension and interpretation of narratives; and performing a personal balance; assuming contributions “[...] on teaching, the first images built, the meanings attributed to the profession, the unfolding of a trajectory, but also the biographical events that establish reflection, reorganization of pathways in teaching” (Abrahão, 2011, p. 44). Biographical work is based on the hypothesis of the transformative power of life stories, which serve as the main thread of the exercise of “walking for yourself,” under the light of (res)significations and of the meanings produced with (auto)biographies (Josso, 2004, 2009). In the case of the creation of memorials, with written or oral narratives, for instance, in our view the essentiality of the process is in valuing the theoretical and epistemological fundamentals typical of the practice with life stories/experiences that seek to give meaning to human and profession training.

The experiential approach calls to a meeting with oneself, as the contact, the interaction with others is also established. Reflective, dialogic processes, which aim at criticizing individual or collective experiences, unfold into comprehensions and interpretations admitted in their (trans)formative potential. In the case of teaching, “knowing” and “knowing-doing” are, under that optics, (res)signified and developed in articulation with contemporary demands of society and education, which, when reflected from the perspective of initial teacher training in environmental education, shall be able to involve the construction of

Environmental Knowledge guided by reflections on (un)sustainability, under the light of the circumstances and contexts that delimit life experiences and emerge from (auto)biographies.

When referring to the work with life stories and its implications in training and social practices Josso (2020, p. 47) highlights: “[...] I do not claim the biographical paradigm solves all problems, but it is a relevant and significant contribution to an active attitude in the life of the community that takes interdependences into account.” Therefore, we also take a stance, after all it seems to us an excessively pretentious discourse that, aware of all the complexity aforementioned, exhibits a salvationist character in face of so many social and environmental challenges. Nevertheless, going back to the inquiry by Reigota (2012) on what environmental researcher-educators will make of the different generations and on the consequent (dis)continuity of Environmental Education, we notice in Experiential Knowledge a powerful pathway for building Environmental Knowledge and promoting Environmental Education.

Experiential Knowledge assumes creating life lessons and learnings exhausted in the work with life stories centered around training, in processes that stand out both in the processes of (self)knowledge and in the creation of knowledge and personal, professional knowledge-doing. It even stimulates the construction of life projects, knowledge, and development of the profession. Considering Experiential Knowledge from the university context, corroborating what Eschenhagen (2016) points out, enables problematizing the ongoing unsustainability and, with that, seeking pathways to promote sustainability, in this case under the light of existential singularities and emerging environmental contexts of (auto)biographies.

With that in mind, we will seek to outline the intersections between Environmental Knowledge and Experiential Knowledge and, thus, develop the concept of “Experiential Environmental Knowledge.” The construction of that concept carries as reference results obtained empirically in the creation of memorials with a group of Pedagogy students in the context of initial teacher training in Environmental Education.

EXPERIENTIAL ENVIRONMENTAL KNOWLEDGE

Experiential Environmental Knowledge presents itself as an alternative answer to the restoration of the life-knowledge link. We conceive environmental complexity and the interrelations between real and symbolic elements, comprised by Environmental Knowledge (Leff, 2015), as guiding axes of a thought, a rationality that, when associated with the work with life stories/experiences, even if it does not allow us to solve all ongoing problems (Josso, 2020), opens doors to a new academic, scientific, professional horizon and that contributes towards the construction of sustainable societies.

In face of the initial assumption (that Environmental Knowledge, when dealt with on the interface of life experiences, mobilizes processes of initial teacher training on Environmental Education), we create and develop research-training motivated by the justifications and reflections hereby discussed. Research-training was based on the theoretical references mentioned, on the (auto)biographical

method associated with creating the memorial, on a processual-practical dynamic involving 21 Pedagogy students and among which 6 memorials were selected for the analysis/interpretation step as they met structural, procedural, and semantic elements of biographical work. We highlight such exercise in its power of generating knowledge and understanding of the environment and life trajectories.

The process of creating the memorial was characterized by individual and socialized activities, both written and oral, that showed the singular face inherent to life trajectories that, when taken as a whole, enabled plural notions of existence and cooperate for the environment to be revealed under the light of the experiences reported. We bet on this process as a device promoting Environmental Education, especially when considering what Leff (2015, 2019) discusses about Environmental Knowledge being a policy of life, of diversity, of difference. That investment, by an outline able to communicate the intersections between Environmental Knowledge and Experiential Knowledge, led us to the following question: *Which elements characterize Experiential Environmental Knowledge and enable describing it in its theoretical-epistemological and methodological basis?*

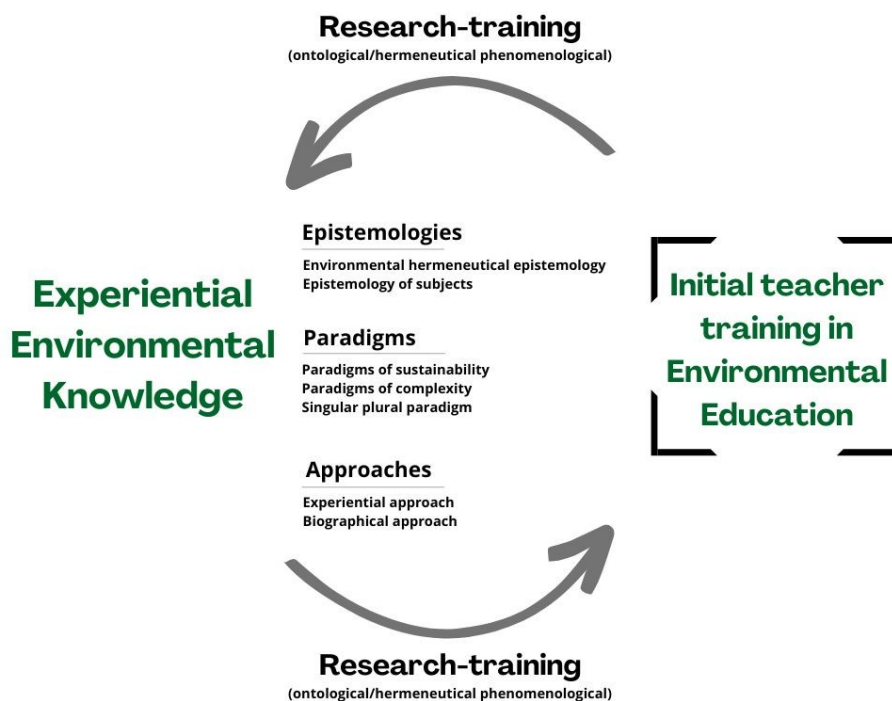
First of all, given the intersectional nature of Experiential Environmental Knowledge, we highlight its relationship with environmental ethics and justice, with the idea that life is expressed under several and different forms and that sustainability consists in a way of living that allows the development of less unequal and unfair relations. Experiential Environmental Knowledge is symbolically projected onto a horizon delimited by new ways of existing, being, and intervening in the world being possible, which, in the case of future teachers, involves considering teaching associated with the responsibility of building sustainable cultures.

At the theoretical level, Experiential Environmental Knowledge extrapolates the borders of Environmental Knowledge and Experiential Knowledge themselves, expanding such concepts from the perspective of the “life experiences-environmental knowledge” link. Its epistemological approach is based on two objects of reflection, the environment and life experiences, which are considered in their relationship with social and environmental ethics and justice. Its ontological and axiological expression delimits the epistemic intersection between Environmental Knowledge and Experiential Knowledge, leading to research processes and practices and initial teacher training on Environmental Education, whose mobilization means stimulating the creation of existential notions associated with the construction of values, bound by the “teaching-sustainability” link that develops reflections on the contemporary civilizatory and environmental crisis.

At the methodological level, Experiential Environmental Knowledge is characterized as a processual-practical dynamic of a reflective, dialogic, narrative, interpretative character. The creation of memorials is one of those methodological possibilities in a process of research and training based on the construction of Environmental Knowledge (Leff, 2015) associated with life experiences (Josso, 2004; Abrahão, 2011). That process enables the development of (self)awareness and constitution of identities, made up of steps of individual and collective production, via retroaction and prospection exercises focusing on the present.

That said, we present below the fundamentals of Experiential Environmental Knowledge (Figure 1):

Figure 1



Source: Freitas (2024).

The scheme above represents the dynamic movement of research-training and the dual nature of the process: investigative and formative. We point to the epistemologies, the approaches, the paradigms typical of Experiential Environmental Knowledge. We highlight that, both theoretically and empirically, mobilizing it requires taking into account the centrality of the process in the subjects and their (auto)biographies, understanding them as a potential source of emergence and management of environmental knowledge related to the life trajectories of future teachers. The systematization and deepening mediated on recollections-references allow, under the light of the fundamentals discussed until this point, stimulating world previously non-existent views about oneself and about others, or not necessarily matured according to the configuration of thought and reflection promoted during the biographical world mobilized among components of a given group.

At the empirical level, taking into account the biographical work carried out with the group of Pedagogy students, we call attention to two main socioenvironmental questions that arose during the creation of memorials related to: I) Floods/Inundations; II) Waste/garbage management. Life experiences related to floods/inundations in a given context of the Zona da Mata region of the Brazilian state of Minas Gerais point to possibilities of building Environmental Knowledge under the light of learnings and lessons coming from the contact with materials and immaterial losses deriving from that scenario. The experience of one student in relation to the daily contact with her father and the waste collection work he

performs, as a street sweeper, was also acknowledged as a life experience from which lessons and learnings emerged related to contradictions and challenges understood by that professional group. Such process of building Environmental Knowledge in the relation with life experiences resulted in what we dubbed Experiential Environmental Knowledge.

We understand that other life stories/experiences allow broadening the discussion on the environmental issue articulated with teaching, thus contributing to knowing and understanding life pathways and training of future teachers, of social and environmental challenges which this group has faced, of life lessons and learnings exhausted in the process of building Environmental Knowledge. Sociocultural and natural elements, hence, consubstantiate the narratives, enabling the analysis of circumstances and contexts lived, as well as (re)signifying them via interpretations conducted in the space/time of initial training, stimulating a sustainable university culture and a commitment with the valorization and co-existence of lives, beings, knowledge, and culture. That corroborates what Eschenhagen (2016) discusses about the role of universities in promoting sustainability and shedding light onto the crisis in effect, and what Angeli and Carvalho (2020) point out about the potential of Environmental Education for the construction of sustainable societies, besides enabling the comprehension of socioenvironmental injustices and critical formation.

Finally, we seek to interpret the life experiences and Environmental Knowledge mobilized. From that exercise, we present an interpretative synthesis of the lessons and learnings found in the (auto)biographies:

I. Problematicizing: The dilemma of waste/garbage management from the perspective of the socioenvironmental role of collectors/sweepers and the contradiction related to the collection work; the dilemma of floods/inundations and the challenges of pollution in their relation with human actions driven by economic interests guided by financial profit and that takes precedence over the search for quality of life and ecological balance;

II. Knowing and understanding: The socioenvironmental harm resulting from the inappropriate disposal of waste/garbage and the risk present in the labor of collectors/sweepers; the society-nature relationship and the implications of unsustainable human action on the occurrence of floods and inundations;

III. Thinking and reflecting: About the generation, disposal, and collection of waste/garbage under the optics of consumerism and the pollution caused by improper disposal/management; about the socioeconomic inequality demonstrated in the context of the environmental crisis lived in recent years in relation to floods/inundations and with attention to the concomitant local- and global-scale sanitary crisis deriving from COVID-19;

IV. Discussing: The proper disposal of waste/garbage as an individual and collective, private and public ethical commitment and the reuse of materials as an educational approach of a sustainable character, aware to the fact that reaching better socioenvironmental conditions requires criticism to consumerism and reducing consuming practices responsible for feeding commercial sectors that negatively impact the development of sustainable work; values and strategic actions so as to prevent the socioenvironmental crisis, understanding them as

pathways to sustainability and the search for better environmental and life conditions on the planet;

V. Criticizing and intervening: On the management of waste/garbage in face of the role of collectors in the construction of a sustainable culture; on the mobilization of citizenship, of ethics, and of environmental justice; on the issue of the production-purchase-profit circuit; on the reality from the community work articulated with public authorities; with actions of participative and democratic nature, understanding critical education as a path for training and responsible action and the promotion of sustainability.

The issues hereby discussed have led us to reflect on how other contexts, other circumstances have been laid out, what other life stories and experiences of future teachers point to, whether environmental knowledge is present or absent in training processes (or even where, when, and how they occur). By sharing them, we aim to foster the study of Experiential Environmental Knowledge in other subjects, in other realities, understanding it as a new “strategy of power in knowledge” (Leff, 2012). They are: *How has the contact between Environmental Education and Environmental Knowledge been established? What do similar, or not, life experiences demonstrate? What do other life reports (d)enounce and what other possibilities of building Experiential Environmental Knowledge do they elicit?*

FINAL CONSIDERATIONS

In this paper, we established as main objective the development of the concept of Experiential Environmental Knowledge and its fundamentals under the light of the proximity between Environmental Knowledge and Experiential Knowledge, looking into its implications in the context of research and initial teacher training in Environmental Education. We list characteristics that point to the ontological and axiological dimensions intrinsic to this concept, as well as the contemplated approach of values such as environmental ethics and justice and the notions created about “existing,” “being,” and “intervening” in the world. Experiential Environmental Knowledge corroborates the approximation between teaching and sustainability, cooperating for the strengthening of the life (experiences)-(environmental) knowledge link. The biographical work with life experiences centered around initial teacher training in Environmental Education proves a promising strategy both in research activities and in training, while the training memorial is an important instrument to carry out those activities in group dynamics.

We consider Experiential Environmental Knowledge as a theoretical-methodological construct through which natural and sociocultural elements are evoked and, depending on the contexts of the singular circumstances of life stories and/or the meanings produced from them, a plural scenario is mobilized of the ways of “existing,” “being,” and “intervening” in the world. Promoting it in pedagogy courses works towards the maturing of the teaching activity and identity in the axiological and ontological dimensions. Approaching it reveals the inherent complexity of subjects and their life practices and training, under the light of (auto)biographies, fostering a university practice committed with environmental training, with the continuity of studies on Environmental Education, and calling

upon future teachers towards the global responsibility of building sustainable, ethical, and fair societies.

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NOTES

1. Paper translated by Guilherme Costa (Portuguese → English).
2. We carried out a bibliographical survey based on the single descriptor “saber ambiental” (“environmental knowledge” in Portuguese) on seven different databases²: *Revista Brasileira de Educação Ambiental*; *Revista Eletrônica do Mestrado em Educação Ambiental*; *Ambiente & Educação: Revista de Educação Ambiental*; *Revista Pesquisa em Educação Ambiental*; *Biblioteca Digital Brasileira de Teses e Dissertações*; *Estado da Arte da Pesquisa em Educação Ambiental (EArte – Plataforma Fracalanza)*; and Scientific Electronic Library Online. We identified a total of 213 productions (scientific papers, theses, and dissertations), among which we reviewed 16 studies published between 2005 and 2020 (Freitas, 2024).
3. For more information on the methodological pathway and results obtained, we recommend reading Freitas (2024).

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