

CONCEPTUALIZING NATURE THROUGH METAPHOR IN LIFE SCIENCE EDUCATION: A QUALITATIVE INVESTIGATION

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Abstract. Language plays a fundamental role in shaping how individuals conceptualize, interpret, and describe the natural environment. In educational settings, particularly in Life Sciences programs, students often rely on metaphorical language to express their relationship with nature and environment. Drawing on Conceptual Metaphor Theory (CMT) developed by Lakoff and Johnson (2003), this study investigates how first-year university students conceptualize nature through conventional metaphors. Qualitative data were collected through semi-structured interviews with students enrolled in various Life Sciences fields, including horticulture, landscaping, genetics, biotechnology, and biology at the University of Life Sciences (ULS) in Timisoara. Using qualitative content analysis (Silverman, 2006), the study identifies recurring metaphorical expressions and categorizes them into three primary source domains: ANIMALS/BEINGS, HABITATS, and OBJECTS/FEELINGS. The findings suggest that students frequently conceptualize nature as a nurturing parental figure, a home-like habitat, or an emotional entity that evokes feelings of connection, gratitude, enchantment, or concern. These metaphors reflect broader sociocultural interpretations of human–nature relationships and reveal how environmental awareness and academic specialization influence linguistic representations of nature. The study contributes to research in environmental linguistics, cognitive linguistics, and English for Specific Purposes (ESP) education by highlighting the importance of metaphor awareness in Life Sciences communication and environmental discourse.

Keywords: English for Specific Purposes (ESP), ecolinguistics, semiotics, teaching, humanities, life sciences.

INTRODUCTION

The relationship between language and human perception of the natural world has long been a subject of inquiry in linguistics, environmental studies, and education. Linguistic expressions often encode cultural values, cognitive patterns, and emotional attitudes toward nature. Metaphors, in particular, serve as powerful cognitive tools that allow individuals to understand abstract or complex concepts through more familiar experiences (LAKOFF & JOHNSON, 2003).

Cognitive linguistic perspectives view metaphor as a fundamental aspect of both language and human thinking, present in many forms of everyday communication (Lakoff & Johnson, 2003). From this perspective, metaphor serves an important cognitive role by helping individuals organize and interpret their experiences. These ideas form the basis of Conceptual Metaphor Theory (CMT), proposed by Lakoff and Johnson (2010), which explains how abstract concepts are understood through metaphorical structures. Lakoff (2014) further explains metaphor through the notion of cross-domain mapping, describing it as a mechanism that enables people to understand one area of experience in terms of another. In this framework, metaphor involves a mapping between two conceptual domains: a source domain, which provides the conceptual structure, and a target domain, which is interpreted through that structure. In other words, the characteristics of the source domain are used to make sense of the

target domain. For example, metaphors such as Nature is a mother or The Earth is our home illustrate how individuals frame their relationship with the environment.

CMT argues that metaphor is fundamental to human cognition. Rather than existing solely as a rhetorical device, metaphors structure everyday thinking and language. Conceptual metaphors involve systematic mappings between a source domain and a target domain, enabling individuals to conceptualize abstract phenomena through concrete experiences. Research in cognitive linguistics has demonstrated that metaphors influence not only language but also perception, reasoning, and decision-making (KÖVECSES, 2010). In environmental communication, metaphorical framing can shape attitudes toward ecological responsibility and environmental policy (NERLICH, KOTEYKO, & BROWN, 2010). Furthermore, metaphors structure how people conceptualize nature, environmental responsibility, and ecological relationships (CHARTERIS-BLACK, 2004).

In environmental language and discourse, nature has historically been conceptualized through a wide range of metaphors. Some metaphors portray nature as nurturing and benevolent, while others depict it as fragile, threatened, or hostile (LAKOFF, 2010). One of the most widespread metaphors is Nature as Mother, which reflects cultural beliefs about nurturing, protection, and fertility (MERCHANT, 1996). Another common conceptualization portrays nature as a home or habitat shared by humans and other living beings. This metaphor emphasizes belonging, sharing, and responsibility within ecosystems. On the other hand, Hajer (1995) introduced the concept of environmental discourse as a structuring force in policy processes, while later work by Fischer (2019) demonstrates how such discourses continue to shape contemporary climate debates under conditions of post-truth politics (MOSER, 2010; SEMINO, 2008).

These analyses reveal how environmental debates (e.g. climate change) are shaped by competing “truth regimes,” where scientific knowledge is reinterpreted through politically or socially constructed narratives (FISCHER, 2019). Contemporary environmental discourse increasingly includes metaphors expressing loss, disconnection, and ecological crisis (NERLICH, KOTEYKO, & BROWN, 2010). Stibbe (2014) further extends this line of inquiry by showing how discourse shapes ecological attitudes and behaviors, emphasizing that the narratives embedded in language can either reinforce or challenge environmentally harmful practices. Together, these contributions illustrate a shift toward a more integrated understanding of environmental discourse, finding links between language, the formation of ecological meaning, and action in contemporary society.

Within educational contexts, language also plays a key role in shaping environmental awareness. In this line of research, ecolinguistics conceptualizes language as a system of “stories we live by,” (STIBBE, 2015), where discourse shapes ecological cognition and behavior, a perspective increasingly applied in environmental education and ESP (English for Specific Purposes) to foster critical awareness of sustainability narratives. Research in environmental linguistics by STIBBE (2015) suggests that students’ linguistic representations of nature influence their ecological attitudes and environmental engagement. In English for Specific Purposes (ESP) education, particularly for Life Sciences students, vocabulary acquisition often focuses on technical terminology related to biological processes and environmental systems. However, learners also employ metaphorical language to express personal and emotional relationships with nature (HYLAND, 2006). Examining such expressions can provide insights into how students integrate scientific knowledge with personal environmental experiences.

For this purpose, metaphor analysis is conducted using qualitative research approaches. A widely used technique is content analysis, which enables researchers to detect repeated patterns or thematic structures within linguistic data (SILVERMAN, 2006). By applying systematic procedures, metaphorical language can be organized into conceptual areas that shed light on underlying cognitive frameworks. This approach has been extensively utilized in research on environmental discourse, communication in educational settings, and the ways nature is culturally conceptualized and represented (CHARTERIS-Black, 2004; STIBBE, 2015).

This study explores the metaphorical expressions used by first-year Life Sciences students when describing their relationship with nature. By examining the conceptual metaphors present in their discourse, the research aims to better understand the cognitive and emotional dimensions underlying students' environmental perspectives and linguistic choices. Students in Life Sciences disciplines interact with scientific representations of ecosystems, biodiversity, and environmental processes; however, their personal conceptualizations of nature are frequently expressed through everyday metaphorical language. Understanding these metaphors can reveal how learners perceive their role within ecological systems.

MATERIAL AND METHODS

The study relies on ecolinguistics (DRAGOESCU URLICA & STEFANOVIĆ, 2018; STIBBE, 2015), ecosemiotics, as well as edusemiotics (STABLES, 2006; STABLES, 2012; STABLES & SEMETSKY, 2015) as theoretical approaches. The paper adopts a qualitative research design to explore metaphorical expressions describing students' relationship with nature. Qualitative methods are used to analyze metaphor usage in discourse analysis, while content analysis allows researchers to identify recurring themes and patterns in language data (SILVERMAN, 2006). Qualitative data has been collected using semi-structured interviews during the academic year 2025-2026 at the ULS University from Timisoara, Romania. Participants included first-year students enrolled in Life Science programs from several fields of study, including: Horticulture, Landscaping, Genetics, Biotechnology, Biology. These fields were selected because they involve frequent engagement with environmental concepts and ecological systems.

Participation was voluntary, and all students agreed to the use of their answers for academic research purposes. This methodological approach has been widely applied in studies examining environmental discourse, educational communication, and cultural representations of nature (CHARTERIS-Black, 2004; STIBBE, 2015).

RESULTS AND DISCUSSIONS

The analysis is grounded in Conceptual Metaphor Theory and uses qualitative content analysis to identify recurring patterns in student discourse. Through systematic coding, metaphorical expressions can be grouped into conceptual categories that reveal broader cognitive structures, as described by this study. Qualitative data were collected through semi-structured interviews during classroom discussions and debates following tasks from the Ecological English text book for first-year students. This method allows participants to express their perceptions freely while providing the researchers with a flexible framework for guiding the conversation. During class discussions, students were asked questions related to: their personal relationship with nature; how they perceive environmental changes; their emotional responses to environmental issues; the role of nature in their academic field. The free discussions generated descriptive statements that often included metaphorical expressions

about nature. The study analyses expressions conventionally used when describing students' relationship to nature.

The data were analyzed using content analysis and qualitative methods described in the preceding section. These methods have been applied to identify themes and decode meaning, by which the study investigated specific strategies employed by ESP for Life Science learners. The analysis involved several stages: transcription of responses; identification of metaphorical expressions; classification of metaphors according to source domains; interpretation of cognitive and emotional meanings. Following Lakoff and Johnson's (2003) framework, metaphorical expressions were grouped into three main source domains: Animals/Beings, Habitats, and Objects/Feelings. Students' anonymous responses collected during class activities were used as research data in this study, with their consent. The findings of the study revealed that students employ metaphorical expressions and conceptual schemas in referring to nature and they are keen on acquiring specific vocabulary related to their field of study.

The first category, Nature as a Living Being, included metaphors that conceptualize nature as a living entity or nurturing figure. Students frequently used expressions such as: Nature is our mother, Mother Earth, Nature is a nurturing parent. These metaphors reflect the conceptual mapping Nature is a parent, where nature is perceived as providing care, nourishment, and protection. Such expressions suggest a perception of nature as benevolent and life-sustaining. The metaphor of Mother Earth has deep historical and cultural roots, appearing in many traditions worldwide (MERCHANT, 1996). In the students' discourse, this metaphor also conveys a moral dimension: harming nature is perceived as harming a parental figure, which is deemed a major category of evil action or even a capital sin.

The second category, Nature as Habitat or Home, includes metaphors that frame nature as a living environment or habitat. The most common expression identified in the interviews was: Nature is our home/shared garden. This metaphor reflects the conceptual mapping The earth is a home, emphasizing belonging and shared existence between humans and other species. From an environmental perspective, this metaphor may encourage ecological responsibility, as individuals tend to care for spaces they perceive as their home (HAJER, 1995).

The third category, Nature and Emotional Experience, involves emotional or experiential metaphors that describe feelings toward nature. Students expressed both positive and negative emotional responses. Positive expressions employed by students included: feeling connected to nature, feeling grateful for nature's offerings, feeling enchanted by the beauty of nature. Such emotional expressions were particularly frequent among students studying horticulture and landscaping, fields closely associated with aesthetic appreciation of natural environments. Negative expressions also emerged, reflecting concerns about environmental degradation: feeling disconnected from nature, feeling disenchanting because of pollution and resource loss, feeling threatened by climate change, environmental degradation, recurrently employed by Biology students. These metaphors illustrate the emotional complexity of contemporary environmental discourse, as students simultaneously perceive nature as beautiful and endangered, with a general feeling of menace.

The analysis of sociocultural influences on environmental metaphors suggests that many metaphorical expressions used by students correspond to basic conceptual metaphors shared across cultures. These emerge from sociocultural interpretations of the relationship between humans and the natural world, which have universal expression. For example, the Mother Earth metaphor reflects traditional ecological beliefs, while metaphors of environmental loss mirror modern ecological concerns such as climate change and pollution.

Thus, metaphorical language reveals not only individual perceptions, but also broader cultural narratives about nature and environmental responsibility.

Finally, we reflect on the implications for ESP and environmental education highlighted by this study. The findings point to the importance of integrating metaphor awareness into English for Specific Purposes (ESP) instruction for Life Sciences students (DRAGOESCU, 2022; URLICA, STEFANOVIC, KAMBERI, & BOGUSLAWSKA-TAFELSKA, 2021). While technical terminology is essential for scientific communication, metaphorical language plays a crucial role in expressing environmental values and ethical perspectives. Encouraging students to reflect on the metaphors they use may enhance: environmental awareness, critical thinking about ecological discourse, as well as communication skills in environmental contexts. Ultimately, understanding metaphorical framing also has the potential to help educators design more effective environmental education strategies and curricula.

CONCLUSIONS

This study examined metaphorical expressions used by Life Sciences students to describe their relationship with nature. Through qualitative analysis of semi-structured interviews, three major conceptual domains were identified: Nature as a living being, Nature as a habitat, and Nature as an emotional experience. The analysis revealed that conventional language includes a number of basic universal metaphors in conceptualizing nature, as a result of sociocultural interpretations of the source and target domains.

The results demonstrate that students rely on deeply rooted conceptual metaphors, such as Nature as Mother and Earth as Home, to express ecological relationships. At the same time, contemporary environmental concerns influence metaphors expressing disconnection, threat, and ecological loss. These findings underscore the role of metaphor in shaping environmental perception and highlight the relevance of cognitive linguistics for environmental education and ESP research. Future studies could explore cross-cultural variations in environmental metaphors or examine how metaphor awareness influences students' ecological attitudes.

In addition, the findings suggest that metaphor use is not only reflective but also constitutive of how students position themselves in relation to the natural world. The interplay between traditional, culturally inherited metaphors and more recent, experience-driven expressions points to an evolving conceptual landscape shaped by both education and environmental discourse. This highlights the potential value of integrating metaphor awareness into Life Sciences and ESP curricula, encouraging learners to critically engage with the language they use and, in doing so, develop more nuanced and responsible ecological perspectives.

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