

Ethnoknowledge and Field Class Activities in Landscape Understanding

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Received: July 3, 2024

Accepted: August 31, 2024

Online Published: January 2, 2025

doi:10.5539/jel.v14n1p194

URL: <https://doi.org/10.5539/jel.v14n1p194>

Abstract

This article addresses the teaching of Geography from the perspective of field classes in a theoretical-methodological approach to be applied in traditional communities. Here, field classes are considered an active methodology that enhances students' understanding of reality, involving local knowledge. The ethnoknowledge of traditional communities is discussed and reflected upon from the perspective of the interaction between academic knowledge and popular knowledge. Additionally, we address the landscape from the perspective of an analysis category. It is observed that well-founded and planned field classes focused on traditional communities and the appreciation of their knowledge lead students to a better understanding of environmental and cultural diversity.

Keywords: ethnoknowledge, field class, teaching

1. Introduction

Geography is a science focused on studying social and natural aspects within the context of spatial organization. The specificity of its studies, whether directed towards societal organization or understanding the dynamics of nature, has generated a wealth of significant information throughout history. Today, as the relationship between society and the use of nature is reaffirmed, it is pertinent to discuss this situation to foster a path of reflection towards achieving equity in ongoing spatial organization and consequently, in the evolution of landscapes. Therefore, it is necessary to reflect on field activities and the values of traditional communities.

Thus, this article highlights field classes, landscapes, traditional communities, and their ethnoknowledge (Souza et al., 2023), within the context of Geography education.

In geographic science, the term "landscape" has taken on a descriptive and narrative focus throughout Traditional Geography. This view was imposed due to the evolution of knowledge related to methodological approaches. Academic discourse facilitates the production of this "knowledge," which had stagnated for several decades. The reflection of this static landscape view permeated schools with an exacerbating focus, where the absence of fieldwork turned what was already static into imaginary. With the evolution of concepts and methodologies, the understanding of landscape transcended the visible aspect, considering the participatory agents of its dynamics. In the specific case of nature, understanding involves its natural dynamics and the influence that society exerts within its context. Associated with this perspective, the study of natural landscapes intensifies through field activities, grounded in empirical evidence and theory. Thus, this moment seeks to reflect on landscape, nature, and fieldwork (Falcão Sobrinho & Costa Falcão, 2008).

Therefore, we envision walking alongside traditional communities, which carry knowledge passed down through generations, mastering their own systems of coexistence with environments. Their identity enables broad references and connections to academic scientific knowledge. In this context, communities such as quilombolas, indigenous peoples, and rural residents are crucial parts of the process.

Here, we refer to traditional communities as defined in Decree 6040 of February 7, 2007: "culturally differentiated groups that recognize themselves as such, possessing their own forms of social organization, occupying and using territories and natural resources as conditions for their cultural, social, religious, ancestral, and economic reproduction, utilizing knowledge, innovations, and practices generated and transmitted through tradition."

In this sense, this article aims to contribute to a potential discussion on field activities. It provides an opportunity to reflect on the conception of landscape in geographic science, based on natural and cultural aspects. It also outlines, albeit in a non-innovative manner, some steps to be implemented in field classes within traditional communities.

It is important to note that field activities or classes, especially in schools, are still underexplored due to financial constraints (transportation) or their exclusion from educational planning. Often, when conducted, they are perceived by society merely as excursions, sadly due to the limited application of this methodology.

Thus, this article presents in its following topics the landscape in the context of geographical science. The second topic elucidates the understanding of nature and society in an academic approach and from the perspective of ethnoknowledge. Furthermore, in the methodology, it presents the proposal of traditional knowledge focused on the practices of understanding soil and water, based on ethnoknowledge and field classes in traditional communities.

2. Understanding the Landscape

The emergence of Geography was marked by empirical studies focused on the description and characterization of nature, particularly natural landscapes, with Alexander von Humboldt as a precursor (Falcão Sobrinho & Costa Falcão, 2023, in Falcão Sobrinho et al., 2023).

With the integration of General Systems Theory into Physical Geography studies, landscape analysis gained a differentiated dimension, beginning to adhere to spatial patterns (Falcão Sobrinho & Carvalho, 2023). It is noteworthy that, with the application of systemic analysis to the representation of natural landscapes, they began to be perceived as delimited entities with specific attributes. This delineation can be seen as the humanization of nature, as it requires sampling or quantification, which is inherently a human interpretation.

Primarily utilizing systemic methodology and the concept of landscape, the geosystem methodology emerged in the former USSR. The term “geosystem” was first used by Sotchava in the 1960s, as referenced by Bertrand (1972) and Sotchava (1977). Sotchava viewed geosystems as connections between nature and human society. They encompass anthropogenic aspects and direct feedback connections, creating a network of organizations that extend into economic and social spheres. Furthermore, geosystems consist of natural phenomena but also consider economic and social factors, with their models reflecting socio-economic parameters of landscapes modified by humans.

The geosystemic approach expanded further with Bertrand in France in 1968, focusing on landscape through ecological elements, biological exploration, and human action.

As natural landscape evolved, the term cultural landscape emerged, where aspects shaped by human intervention encompass cultural and social values. In this perspective, humans are seen as agents modifying the landscape through the construction of concrete structures, cities, cemeteries, rural properties, and more. Cultural geography found its major precursor in Sauer (1925), who introduced discussions on the phenomenology of landscape, later elaborated upon by Dardel (1952) and Relp (1976), among others.

The concept of landscape as an analytical category has been debated according to researchers’ specific perspectives and their approaches to geographical knowledge. In this regard, it is thought that the dimension of the natural landscape should be approached dialectically, addressing the interaction of natural and social factors. As stated by Falcão Sobrinho (1999), “the landscape is constantly evolving, and in this dynamic process, whether due to natural, social, or integrated causes, it creates and recreates new landscapes.”

2.1 Configuration of the Landscape Through the Relationship Between Society and Nature

Human activity must be considered in the biological balance of the world since the dawn of humanity, and if its impact is increasingly profound, we should not lose sight of the moment it originated (Dorst, 1973).

In the formation of landscapes, which provide the scenery of planet Earth, several elements are involved, whether natural or resulting from human or societal intervention.

Regarding natural dynamics, there are volcanic activity, earthquakes, seismic events, glaciations, tsunamis, and other less intense but more continuous occurrences such as wind action, precipitation, river processes, among others. All these events, acting individually or in combination, destroy, shape, and create diverse landscapes.

However, the history of Earth only begins to be known with the appearance of humans, who constitute another element in the landscape’s scenery. Since then, their relationship with the other elements that make up the landscape has been one of dependence, whether in the consumption of water, the search for plant and animal nutrients, the use of soil, and other necessities.

It is known that the relationship between humans and the natural physical environment has undergone transformations over time. In historical context, humans began to develop various activities that shaped the landscapes of the planet's surface. These activities can be categorized into two distinct phases: the phase of primitive/nomadic humans and the phase of sedentary humans, both in search of subsistence.

The history of primitive/nomadic humans, dating back to the Lower Paleolithic, describes their relationship with nature in the pursuit of survival. Primitive humans relied on hunting and gathering fruits, which were sufficient for their subsistence. The transformation of the natural landscape did not exert a significant influence in terms of predatory activities during this phase.

The history of sedentary humans begins to solidify with pastoralism, where humans started guiding and caring for sheep, along with the beginning of agriculture for subsistence food production, according to Dorst (1995). Associated with these factors, or influencing these activities, is the increase in population and consequently, the need to produce more food. As the population grows on Earth's surface, the exploitation of natural resources intensifies, leading to increased consumption of animal and plant species, as well as water. These needs tend to generate changes in the overall landscape.

Parte superior do formulário

Parte inferior do formulário

Over time, humans have developed a new approach to the environment they inhabit, shifting from consuming to meet daily biological needs towards accumulation and transformation of raw materials, such as vegetation, into products like clothing, cellulose, etc., on a scale aimed at capital production.

From the discovery of fire to the development of modern techniques, coupled with population growth, changes in the landscape have intensified. Additionally, to sustain themselves, humans have incorporated other needs such as preservatives, canned goods, electrical appliances, and more.

As natural humans emerged on Earth's surface, they began a new relationship with nature as they developed modern techniques to produce and transform food and plant species. This trend intensified with industrialization. At this point, humans transitioned from natural beings to social beings, living in groups where their relationship with natural landscape resources shifted to consuming for subsistence and accumulating capital.

New forms of interacting with nature have evolved alongside population growth, leading to changes in how land is utilized over time and altering the landscape of the natural physical environment.

Thus, as Falcão Sobrinho (2010) argues, the unit of natural landscape, particularly concerning soil, becomes a resource used to meet societal subsistence needs, where the need for food production on a large scale results in intense modification across the entire natural landscape:

Replacing native vegetation with secondary vegetation leads to the extermination of animal species that are predators and essential to the balance of natural landscapes. Altering the soil's relationship with vegetation interferes with its nutrients, structure, promotes erosive processes, and reduces productive capacity. The use of pesticides contaminates the soil, groundwater, and consequently, eradicates microbial life.

It is within this context that sedentary humans evolve, altering the entire natural landscape and creating new landscapes. Subsistence needs serve as a guiding element in landscape dynamics.

Therefore, the teaching of nature in Geographic Science goes beyond the aforementioned natural aspects (relief, climate, soils, vegetation, water resources) to include social aspects, in order to understand the organization of the landscape as a whole. Specific or applied studies are crucial for comprehending the entirety of these interactions.

3. Methods and Techniques

In relation to field activities in traditional communities, specifically in Northeast Brazil, certain considerations should be taken into account when planning the territory. Thus, in the Northeast, particularly in the semi-arid region of Ceará, various technologies for water storage and technical interventions for land cultivation have been implemented. Some of the most well-known include: Mandala System, Biodigester, Calçadão Cistern, Productive Backyard, Trench Bed, Underground Dam, and ecosystem-focused technologies. These realities prompt specific and analytical studies of diverse environments in their natural aspects, while also approaching the understanding of ethno-knowledge, which significantly contributes to academic studies.

Therefore, it is proposed to pay special attention to field activities as an active methodology (Santos & Araújo 2023), following steps outlined by Falcão Sobrinho and Costa Falcão (2008):

Studying the Landscape Through Fieldwork

On one side, the landscape, with its diversity and richness of meanings; on the other, the interpretations that individuals, isolated or in groups, make of it. From these interpretations arise the proposals of types and classifications formulated by specialized readers, the geographers. The geographers and their constructs, which evolve over time, not only because landscapes change, but also because interpretations change... (Coltrinari, 1998).

What is fieldwork?

Fieldwork in geography education is a methodological task aimed at deepening students' understanding of the contradictions and processes of nature appropriation. It allows students to grasp the dynamics of space, influenced both by natural forces and cultural factors.

Fieldwork is essential for geography education but should not be viewed as an end in itself; rather, it is a means to be continued upon returning to the classroom. It transcends a mere break from routine by extending learning beyond the confines of four walls. It is another step in the continuous process of student development.

Theory is crucial for guiding practical application, and practical experience in turn enriches theoretical understanding. For instance, Davis' theory of erosion cycles, first published in 1899, was derived from his imaginative observations and laid the groundwork for geomorphological theory. Subsequently, various other theories built upon Davis' initial concepts.

Coltrinari (1998) cautions against allowing theory to dominate practice to the extent that fieldwork becomes limited to confirming predetermined facts, thus restricting the freedom to interpret cultural and natural realities as they present themselves.

What is the objective?

In a broad sense, the goal is to directly engage students in the field, starting from their prior knowledge. "Teachers in general, and geography teachers in particular, must start from the representations and knowledge that students bring to the school environment. There cannot be a gap between school knowledge—based on theories and methodologies originating from academia—and the multiple social representations that young people have constructed throughout their lives. Students experience geographic space in different ways, in different places, but often without full awareness of this space and its contradictions" (Pontuschka, 2000). This knowledge should be nurtured by theory and reinforced through direct observation of reality, aiming to produce knowledge grounded in both theoretical and practical aspects.

The objective is also to facilitate an understanding of the dynamics of geographic space, moving beyond the view of landscape as something panoramic and static. It encourages reflection over historical processes and evaluation of evolutionary trends. In this way, students can perceive the knowledge presented in textbooks and compare it with the knowledge of individuals within the community.

What is it for? Or why do it?

Bringing students closer to the reality around them, especially in traditional communities, proves to be a valuable tool. Beyond capturing students' attention, it can lead to positive outcomes. This activity fosters closer relationships among students and with their teachers, encouraging them to practice essential attitudes. This not only enhances their assimilation and understanding of specific content but also influences their attitudes and shapes their personalities, which can later benefit their social and professional lives. It's common to observe spontaneous behaviors and actions in students during fieldwork that differ from their behaviors in the classroom.

Coltrinari (1998) asserts, "But it's not just about collecting data with eyes, hands, or instruments during the empirical phase of knowledge construction. Without theories or hypotheses in mind, fieldwork, whether reconnaissance excursions, periodic campaigns for interviews, or process monitoring, risks becoming tedious and exhausting and, rightfully, criticized and rejected."

Methodological aspects of the field class

There is no methodological script to guide field activities. However, some points should be considered based on prior planning, including: the activity's objectives, selection of the area (such as quilombolas, activities in agricultural communities, among others), and the aspects related to the content to be observed, as well as the schedule of activities or stops.

It's worth noting that the preparation for field trips may not correspond to or reveal what can be observed during the journey, as natural or cultural events that influence the landscape are not always predictable. The local culture, including clothing, food habits, and beliefs, must be taken into account.

Sauer (1956) cautioned that field trips and field classes do not require a predetermined organization of observations,

as in the legend of a synoptic map. Plenty of clues—physical, organic, or cultural—will emerge during the journey through observation and exchange of information. A successful field experience can result from a different theme for each participant. For some, the “see-what-you-can-find” approach in fieldwork can be frustrating and disorienting because one does not know in advance what will be encountered. The more effort is focused on recording predetermined categories, the less likely one is to fully explore. I prefer to think that any group of young people in the field is on a voyage of discovery, not engaged in land surveying.

What is the role of the teacher?

The teacher fulfills diverse roles as the organizer of activities. Their function is that of a planner, active across various domains: within the school (administration and coordination), in the field (selecting the study area), and with the students (motivating them in the activity). It is advantageous for the teacher to visit communities beforehand, studying their habits, way of life, agricultural practices, and religious aspects. This prior knowledge contributes significantly to preparing a high-quality lesson.

The teacher is responsible for arranging authorization, in collaboration with school administration or coordination, to facilitate student access to places such as ecological parks, museums, private areas, among others. Public visiting sites often have regulations that should be communicated to students to avoid any potential discomfort.

To conduct effective fieldwork, in addition to theoretical knowledge, the teacher needs familiarity with the area where the activity will take place. Thus, visiting the location in advance (when possible) to understand its characteristics and history is crucial for the success of the activity. Alternatively, the teacher can propose stimulating discussion topics, as Oliveira and Anunciação (2022) did.

Acquiring bibliographic information is essential, as well as obtaining maps of the study area, such as geomorphological, pedological, vegetation, and land use maps.

The teacher should act as a motivator and cultivate students’ interest by asking questions that spark curiosity, emphasizing the importance of this activity as a complement to theoretical lessons.

During fieldwork, the teacher’s role is to guide students, encouraging spontaneous and intelligent observations. Providing clear and organized explanations and responding succinctly to questions are key. It’s unnecessary to rely solely on verbal explanations when surrounded by nature; instead, students should be actively engaged, guided by the teacher.

Schaffer (1998) states, “The study of the city is tied to the teacher’s stance towards their discipline, including their knowledge and commitments to their work. Taking charge of a class and addressing a question requires that the teacher possess at least a mastery of the field of study, enabling them to navigate city-related content found in various publications, working towards pre-defined objectives.”

What should students do?

It is the students’ responsibility to collect data and materials, conduct interviews, make observations, and take notes on natural and cultural aspects. Data should be acquired prior to the field activity, but it’s important to note that the information obtained beforehand may differ from what is gathered during the actual field trip. Students should seek information about the context of the local landscape and its dynamics, including the cultural aspects relevant to the communities in that area.

During the field activity, conducting interviews allows students to obtain information from individuals who experience the daily life of the study area firsthand. It is also a valuable method for uncovering historical narratives that may not be documented in books.

It’s essential for students, as keen observers during the field class, to maintain a neutral perspective on the space and absorb information through optical readings for analytical purposes (Araújo & Falcão Sobrinho, 2009). It is recommended they carry a notebook for recording observations.

Engaging in dialogue with the teacher is crucial for student learning. As Sauer (1956) suggests, “These excursions and field classes provide the best learning. Students and teachers exchange questions and suggestions based on the changing scene, engaging in a peripatetic form of Socratic dialogue about the qualities within the landscape.”

What should the assessment be like?

The analysis should be conducted jointly by students and the teacher, where the collected information is compared and discussed. Upon returning, students will undertake subsequent tasks such as descriptive writing, oral presentations, or other assignments in the following days. These works should be analyzed, discussed, and appreciated.

In subsequent classes, depending on the content to be covered in the discipline, examples from the field trip should be incorporated.

How to dress?

Using appropriate clothing according to the local reality is crucial. Imagine wearing high-heeled dress shoes while climbing a mountain? Additionally, diet is a vital aspect; consuming heavy foods can leave you lacking energy to continue activities after lunch.

Often, your attire can identify the institution you represent, which can facilitate work, especially during interviews. This helps prevent questions from interviewees about political activities in the region, especially in small towns.

4. Results and Discussions

In a field class, a crucial aspect to consider is the role of each natural element within the landscape. According to Costa Falcão and Falcão Sobrinho (2016), each element functions within the context of the whole landscape. Understanding each natural element can lead to an understanding of the overall landscape organization.

It's also important to observe how the exploitation of natural resources not only modifies the natural landscape but also triggers a sequence of events that affect both natural aspects and the community's organization and perception of the landscape. For instance, Marques et al. (2023) highlight how sediment displacement due to soil erosion from improper land management can reduce food productivity, impacting the economy at micro and macro scales and altering landscape dynamics.

Other situations warrant consideration. Endogenous and exogenous forces shape the relief's morphology. However, human activities play a significant role in this process through activities such as dam construction, dune leveling, and non-metallic mineral extraction, as seen in traditional communities with features like mandalas, clay pits, and cisterns. These alterations change the natural landscape's dynamics. The relief's form and its occupation can provide clues to understanding mass movement, whether through landslides or collapses, which can be explored during field activities.

Fieldwork is seen by Coltrinari (2000) as integral to research in Physical Geography, particularly Geomorphology, serving as the foundation that guides research directions.

In the classroom, practical activities can integrate students' artistic expression, such as creating paintings that utilize the varied soil colorations (Costa Falcão, 2014).

Regarding rivers, they are water courses flowing on the terrain's surface, driven by kinetic energy from higher to lower elevations, influenced by geological, geomorphological, and vegetative conditions, and shaped by climate. While rivers follow natural rhythms, human intervention can alter their course, such as through dam construction for urban water supply or irrigation, which reorganizes the landscape anew.

It is important to highlight that human intervention in the natural environment often begins with the removal of natural vegetation or ethnobotanical resources, as studied by Silva et al. (2023). This is often replaced by monoculture, leading to an entirely different ecosystem. These activities involve artificial processes in nature, such as the use of chemical fertilizers to nourish soils, the application of pesticides, and the adaptation of crops to seasons or climatic conditions that may not be suitable for certain plant species.

Therefore, teaching about nature should consider not just individual elements but the entirety of natural components that form the landscape.

It is also crucial to note that the motivation for such research is often rooted in traditional knowledge related to soil and water, also known as traditional knowledge or ethno-knowledge. This knowledge serves as a basis for public policies, triggering a series of favorable situations in support of these policies:

Studying traditional knowledge is essential for preserving cultural diversity and valuing ancestral wisdom, as it enriches humanity. This knowledge, accumulated over generations and transmitted orally, is deeply embedded in daily practices of communities and traditional peoples. By studying traditional knowledge, we acknowledge and appreciate the importance of these unique insights.

Environmental sustainability is also closely linked to traditional knowledge, which often emphasizes harmonious relationships with nature and sustainable use of natural resources. Research in this area provides valuable insights for environmental conservation and addressing challenges like climate change. Carmo and Gonçalves (2023) argue that environmental education should inspire new attitudes favoring nature within our society.

Traditional knowledge spans various fields such as medicine, agriculture, astronomy, and architecture, requiring an interdisciplinary approach for its study. This interdisciplinary perspective enriches academic knowledge across

multiple disciplines.

Studying traditional knowledge promotes dialogue and knowledge exchange between traditional communities and academic scientific knowledge. This exchange fosters a comprehensive understanding of the world and leads to creative solutions to contemporary issues.

Furthermore, integrating traditional knowledge into public policies and development projects can significantly benefit local communities, fostering social and economic development.

Respecting and valuing traditional knowledge is also a form of cultural resistance against epistemic colonialism and promotes greater equity and diversity of knowledge systems.

In summary, studying traditional knowledge is crucial for preserving cultural diversity, valuing ancestral wisdom, promoting environmental sustainability, fostering knowledge exchange, and enhancing community development. It respects local cultures and enriches human knowledge in a holistic manner.

In the context of Geography, traditional knowledge plays a vital role, particularly in studying natural elements of the Earth such as terrain, climate, hydrography, and soils. Local communities with traditional knowledge possess profound understandings of these elements in their living areas, shaped by their interactions with the natural environment.

Moreover, traditional knowledge includes techniques and practices developed over time by communities for managing and using natural resources. These practices often align with the region's natural characteristics, considering soil conditions, climate, and water availability, among others.

5. Final Considerations

Field trips in traditional communities allow students to experience firsthand the reality of these communities, providing a sensory experience that goes beyond what can be learned in the classroom. They establish a comparison between landscapes resulting from intense transformation processes and landscapes unfolding in conservative communities with slow rhythms in daily life.

Field trips in traditional communities not only enrich academic learning but also promote a more holistic, conscious, and respectful education of the diverse forms of life and knowledge existing in the world.

Acknowledgments

Cearense Foundation for Scientific and Technological Development—FUNCAP. Editorial Humanidades, Processo PRH -0012-00029.01.2023.

Authors' contributions

Not applicable.

Funding

Not applicable.

Competing interests

Not applicable.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

References

- Araujo, C. S., & Falcao Sobrinho, J. (2009). O bioma caatinga no entendimento dos alunos da rede pública de ensino da cidade de Sobral, Ceará. *Revista, Homem, Espaço e Tempo*, 3(1).
- Bertrand, G. (1972). *Paisagem e Geografia Física Global*. São Paulo: Cadernos de Ciências da Terra, nº 13. USP/São Paulo.
- Carmo, M. C. J. A., & Gonçalves. L. A. (2023). A educação ambiental como norma e saber necessário no semiárido. *International Journal Semiarid*, 7(7), 288–300. Sobral, Ceará, Brasil.
- Coltrinari, L. (1998). *O Trabalho de Campo na Geografia do Século XXI*. Revista GEOUSP. São Paulo.
- Coltrinari, L. (2000). *Entrevista com a Professora Lilian Coltrinari*. Revista Paisagens. Ano III, n. 4. São Paulo.
- Costa Falcao, C. L. (2014). *Programa de Educação em Solos: conhecer, instrumentalizar e propoagar. Extensionando, cultivando saber na escola e na comunidade 1* (p. 252). Edições UVA.
- Costa Falcao, C. L., & Falcao Sobrinho, J. (2016). A obra de Goethe e o viajante naturalista Humboldt: à prática científica do trabalho de campo. *Ciência e Natura*, 38(3), 1238–1245. <https://doi.org/10.5902/2179460X20062>
- Dardel, E. (1952). *L'Homme et la Terre: Nature de la Réalité Géographique*. Presses Universitaires de France. Paris.
- Dorst, J. G. (1973). *Antes que a Natureza Morra: por uma ecologia política: tradução, Rita Buongiorno* (p. 394). São Paulo, Edgard Blücher.
- Falcão Sobrinho, J. (2010). A paisagem na ciência geográfica. *Revista Homem, Espaço e Tempo*, 4(10), 127–161. Edições UVA, Sobral.
- Falcao Sobrinho, J., & Carvalho, B. L. (2023). A cartografiado relevo como meio de comunicação na ciência geográfica. *International Journal Semiarid*, 6(6), 130–154. Sobral, Ceará, Brasil.
- Falcão Sobrinho, J., & Costa Falcão, C. (2008). Geografia Física: a natureza na pesquisa e no ensino. *Rio de Janeiro: TMAISOIT*, 1(1), 49.
- Falcao Sobrinho, J., & Costa Falcao, C. L. (2023). O entendimento da natureza ao longo da existência humana. In J. Falcao Sobrinho, C. J. O. Souza & J. L. S. Ross (Eds.), *A natureza e a Geografia no ensino das temáticas físico-naturais no território brasileiro*. <https://doi.org/10.56257/lcbk.978-85-7785-852-1>
- Falcao Sobrinho, J., Souza, C. J. O., & Ross, J. L. S. (2023). A natureza e a Geografia no ensino das temáticas físico-naturais no território brasileiro. *Letra Capital Editora*, 1(1), 642. <https://doi.org/10.56257/lcbk.978-85-7785-852-1>
- Marques, E. R. F., Liberado, H. A. G., & Zanela, M. E. (2023). Uma explicação do conceito de paisagem no contexto dos profetas da chuva no nordeste brasileiro. *International Journal Semiarid*, 7(7), 140–150.
- Mendonça, F. (1991). *Geografia Física: ciência humana*. São Paulo: Contexto.
- Oliveria, B. G., & Anunciação, V. S. (2023). Práticas educativas para a prevenção e mitigação dos riscos a queimadas na cidade de Campo Grande-MS, BRASIL Bianca Garcia Oliveira. *International Journal Semiarid*, 5(5), 261–274. Sobral, Ceará, Brasil.
- Pontuschka, N. N. (2000). Geografia, Representaciones sociales y Escuela pública. *Terra Livre*, 15, 145–154.
- Relph, E. C. (1979). *The Phenomenological Foundations of Geography*. Discussion Paper Series. N.21. Universidade de Toronto, 1976. (Traduzido por Herbert Silvio Augusto Pinho Halbsgut. *Revista da Geografia*, 4(7), 1–15.
- Santos, F. E. A., & Araújo, R. L. (2023). Metodologias ativas no ensino de geografia: possibilidades em escolas públicas de zonas rurais, Piauí/PI. *International Journal Semiarid*, 6(6), 16–33. Sobral, Ceará, Brasil. <https://doi.org/10.1111/j.1467-8306.1956.tb01510.x>
- Sauer, C. O. (1925). *The Morphology of Landscape*. University of California.
- Sauer, C. O. (1956). The Education of a Geographer. *Annals, Association of American Geographers*, 46, 287–299. (Tradução de Werther Holzer, UFF. GEOgraphia – Ano II. 2000 Rio de Janeiro).
- Schaffer, N. O. (1988). A Cidade nas Aulas de Geografia. In A. C. CARTROGIOVANNI (Ed.), *Geografia em Sala de Aula Práticas e Reflexões*. AGB/Porto Alegre.

- Silva, A. F. B., Figueiredo, M. F., Souza, E. B., Nascimento, J. B., & Ripardo Souza, M. (2023). Etnobotânica E Educação Não Formal: Construindo Um Acervo Didático De Espécies Nativas Utilizadas Pela Comunidade de São Gonçalo, Meruoca, Ceará. *International Journal Semiarid*, 7(7), 180–198. Sobral, Ceará.
- Sotchava, V. (1977). *O Estudo dos Geossistemas*. São Paulo: IGUSP. USP/São Paulo.
- Souza, R. L., Souza, R. L., Nunes, S. C. L., & Falcão Sobrinho, J. (2023). Ethnoknowledge through Ethnogeomorphology and Geography Teaching: First Approaches. *Journal of Education and Learning*, 12(6), 28–45. <https://doi.org/10.5539/jel.v12n6p28>
- Suertegaray, D. M. A. (2000). O Que Ensinar em Geografia (Física)? In N. Rego (Ed.), *Geografia e Educação Geração de Ambiências*. Rio Grande do Sul.

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