http://doi.org/10.14393/ER-v32e2025-26

The geographical perception of riverine students about the physical-natural components of the Amazon[1]

Dhionatan Willott Guimarães[2]
Marcela Vieira Pereira Mafra[3]
Danielle Mariam Araújo dos Santos[4]

ABSTRACT

This study analysed the teaching of the physical-natural components of the Amazon at a riverine school in the municipality of Iranduba, Amazonas, focusing on students' perceptions and understanding of the interactions between these elements. The research is qualitative, exploratory, and explanatory, and constitutes a case study. The results indicate that the description of the island derives from the students' experiences with the place. However, this knowledge is presented in a fragmented manner, revealing difficulties in connecting the observed phenomena with the scientific concepts that underlie them. This stems from the lack of contextualisation of the Geography content to the school's reality, still guided by teaching materials unfamiliar with the Amazonian reality.

KEYWORDS: Riverine School; Physical-Natural Components; Geography.

[1] English version by Viviane Fontoura. *E-mail:* viviane.fontoura@gmail.com.

[2] Undergraduate Geography student at the Amazonas State University (UEA), Manaus, Amazonas, Brazil. Scholarship holder of the Amazonas Scientific Initiation Support Program (PAIC), funded by the Amazonas State Research Support Foundation (FAPEAM). Orcid: https://orcid.org/0009-0009-2240-9759. *E-mail:* deagabfr@gmail.com.
[3] Adjunct Professor of Geography at the Amazonas State University (UEA), Manaus, Amazonas, Brazil. Orcid: https://orcid.org/0000-0002-6345-0012. *E-mail:* mvieira@uea.edu.br.
[4] Assistant Professor of Geography at the Amazonas State University (UEA), Manaus, Amazonas, Brazil. Orcid: http://orcid.org/0000-0001-7380-9896. *E-mail:* dmsantos@uea.edu.br.

A percepção geográfica de estudantes ribeirinhos sobre os componentes físico-naturais da Amazônia

RESUMO

Este estudo analisou o ensino dos componentes físico-naturais da Amazônia em uma escola ribeirinha no município de Iranduba (AM), com foco na percepção dos alunos e na compreensão das interações entre esses elementos. A pesquisa é qualitativa, de caráter exploratório-explicativo, constituindo-se em um estudo de caso. Os resultados apontam que a descrição da ilha provém das experiências dos estudantes com o lugar. Entretanto, esses saberes são apresentados de forma fragmentada, revelando dificuldades na articulação entre os fenômenos observados e os conceitos científicos que os fundamentam. Isso decorre da pouca contextualização do conteúdo de Geografia para a realidade da escola, ainda pautado por materiais didáticos alheios à realidade amazônica.

PALAVRAS-CHAVE: Escola Ribeirinha; Componentes Físicos-Naturais; Geografia.

La percepción geográfica de los estudiantes ribereños sobre los componentes físico-naturales de la Amazonia

RESUMEN

Este estudio analizó la enseñanza de los componentes físicos y naturales de la Amazonía en una escuela ribereña del municipio de Iranduba, Amazonas, centrándose en las percepciones y la comprensión de los estudiantes sobre las interacciones entre estos elementos. La investigación es cualitativa, exploratoria y explicativa, y constituye un estudio de caso. Los resultados indican que la descripción de la isla se deriva de las experiencias de los estudiantes con el lugar. Sin embargo, este conocimiento se presenta de forma fragmentada, lo que revela dificultades para conectar los fenómenos observados con los conceptos científicos que los sustentan. Esto se debe a la falta de contextualización del contenido de geografía con la realidad de la escuela, que aún se basa en materiales didácticos poco familiarizados con la realidad amazónica.

PALABRAS CLAVE: Escuelas Ribereñas; Componentes Físico-Naturales; Geografía.

* * *

Introduction

Understanding the lived space of riverine communities in the Amazon requires an integrated approach that joins physical and natural elements to local social practices. In the community of Santa Luzia da Ilha do Baixio, located in the municipality of Iranduba, in the state of Amazonas, seasonal variations in the Solimões River – such as high and low tides – directly influence the landscape, economic activities, and the operation of the local school.

In spite of this strong connection between the natural environment and daily life, Geography teaching in the community school is still predominantly based on poorly contextualised educational materials, far removed from the Amazonian reality. This limitation compromises the dialogue between the students' empirical experience and scientific knowledge, highlighting a gap in curricular adequacy.

Given this context, this paper aims to analyse the perceptions of students at a riverine school in Iranduba regarding the physical-natural components of the Amazon, with an emphasis on understanding the interactions between the natural elements present in the region.

The relevance of the study lies in the need to strengthen geographic education in rural and riverine contexts, valuing local knowledge, fostering the development of territorial identity, and developing the students' geographic reasoning. Through interviews and questionnaires, the aim is to discuss the results, considering the students' socio-environmental realities, and contribute to the development of more contextualised and effective pedagogical practices.

Riverine Communities: Identity, Territory, and Relationship with the Environment

Life in Amazonian riverine communities is characterised by a strong connection with the rivers and natural processes that shape the landscape. Cruz (2007, p. 8) describes a riverine dweller as someone who lives along the

riverbanks, in the country or the city, attributing the term to a direct relationship with the peasantry and the world of work. This definition expands the traditional understanding of the concept, considering the diversity of ways of inhabiting and producing the space along riverbanks.

Ferraz (2010, p. 24) agrees with this understanding by associating riverside dwellers with peasants who, in addition to living along rivers, have as their main economic activities the extraction of forest-aquatic resources and small-scale agriculture. Both authors emphasise the multifunctional nature of the river in riverine life, recognizing it as a space for the production, circulation, and reproduction of social life.

Victória (2012, p. 5) offers a complementary view by emphasizing the role of the river in the communities' cultural and social organization, reinforcing that riverine life is profoundly shaped by daily interactions with water. His analysis highlights that rivers, more than natural resources, structure local experiences and identities.

These authors' conceptions converge in recognizing the socially constructed nature of riverine spaces but differ in their approaches: Cruz and Ferraz prioritise productive and territorial aspects, whereas Victória directs his analysis to cultural and subjective dimensions. This theoretical diversity is fundamental to understanding the multiple facets of the space experienced by the students at the school which was the subject of our research.

Considering these different approaches, it becomes necessary to recognise the specificities of riverine territoriality in Geography teaching, understanding it as a space for the production of knowledge and meanings that go beyond the simple categorization of population groups.

Geographicity and Education: Attributing Meaning to Lived Space

Geographicity is defined by Claval (1997, p. 89-90) as the relationship that space has in people's lives, constituting meaning to the environment and resulting in the way people use space to situate and understand

themselves. Therefore, it is understood that the human dimension and all its relationships with geographic space must be considered in any analysis of geographic science and not as an immutable force.

In the riverine context, this relationship is marked by intense coexistence with the physical and natural components of the Amazon. The river flow, the soil type, and the vegetation are perceived, felt, and incorporated into daily life, shaping social practices and local knowledge. This direct experience reinforces the construction of a unique geographicity, which does not always connect with the scientific knowledge developed in schools.

Duarte, Fraxe, and Nogueira (2020, p. 85) show that riverine students develop environmental perceptions grounded in everyday experiences. However, these perceptions often have conceptual gaps. Although students recognise natural phenomena, their explanations are often based on empirical observations, lacking any connection to structured geographic concepts.

This finding reinforces Claval's (1997, p. 89-90) warning about the importance of valuing the individuals' spatial representations, without neglecting the need for pedagogical mediation that broadens the understanding of natural processes. The challenge, therefore, is to connect local knowledge with the formal school Geography syllabus.

Rural Education and Geography Teaching in Riverine Contexts

The teaching-learning process of physical-natural components in Geography is intrinsically connected to the landscape, and it should be approached in an integrated manner, as Cunha and Leite (2020, p. 36) suggest. While understanding that humans do not entirely influence these components, they cannot be dissociated from anthropogenic action and its influence on individuals' lives.

Accordingly, Silva et al. (2022, p. 38) indicate some problems in the teaching-learning process of Physical Geography elements, highlighting

teacher training, the geographers' reduced interest in this subject, and textbooks as the main causes of disintegration.

This disintegration is common in the context of Amazonian rural schools. Alcântara (2008, p. 12) noted this when mentioning that little importance was given to forest components as a teaching resource. This reinforces the need for a curriculum that engages with local realities, using landscape elements as learning tools.

Ramos, Moreira, and Santos (2004, p. 35) agree with this line of thinking by arguing that rural individuals, including riverine communities, should be the main actors in curriculum development, with pedagogical practices that consider their cultural, social, and environmental specificities. Therefore, education aimed at riverine communities should have a curricular structure and pedagogical work that consider their daily experiences.

The methodological principles proposed by Ramos, Moreira, and Santos (2004, p. 37-40), such as the appreciation of local knowledge and the connection between the school environment and the students' realities, are essential for rethinking Geography teaching in riverine schools. They emphasise that the inlands are not homogeneous spaces and, therefore, that the curriculum must respect each community's unique characteristics.

In this sense, Geography teaching in rural schools should be directed, as Copatti and Callai (2018, p. 237) rightly explain, at addressing the prior knowledge of the people who make up the rural way of life. This should encompass the use of natural resources to teach the physical-natural components of the Amazon in the context of riverine schools.

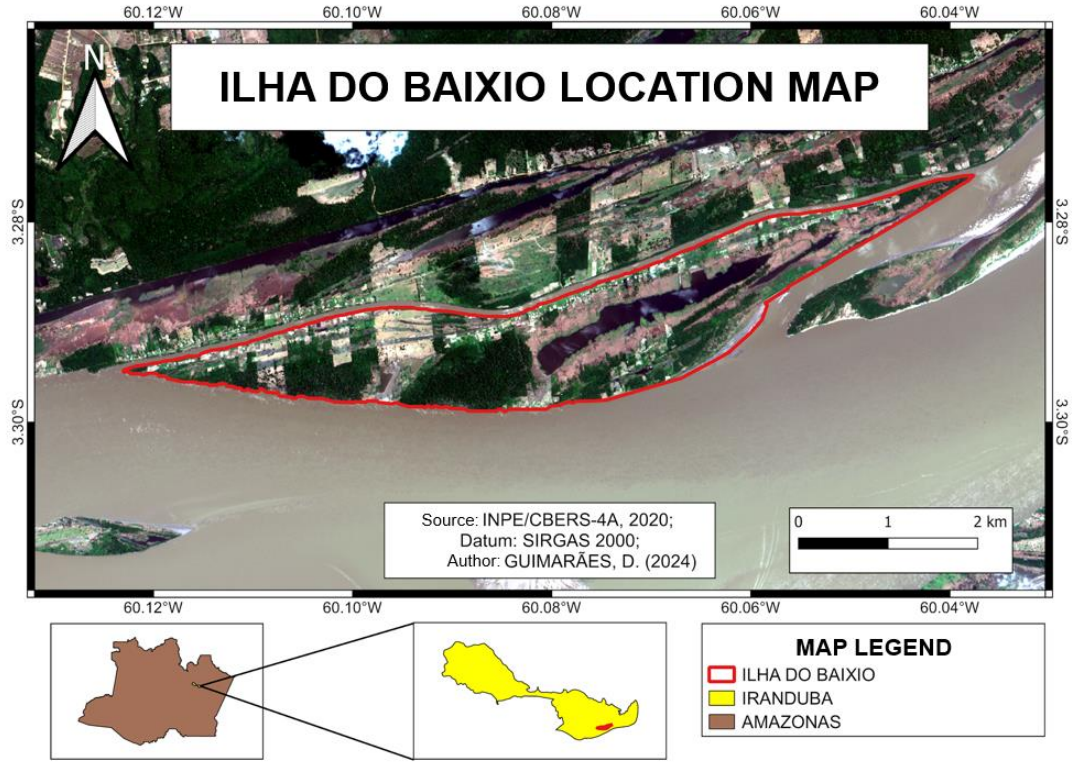
Therefore, by articulating the contributions of Ramos, Alcântara, Cunha, Leite, Copatti, and Callai, it becomes clear that rural education, in the riverine context, must incorporate methodologies that value the students' experiences, fostering dialogue between local and scientific knowledge, and enabling an integrated understanding of the physical and natural phenomena of the Amazon.

Methodology

The research method is phenomenological and qualitative, and according to Minayo *et al.* (2002, p. 21-22), seeks to answer specific questions – the Cartesian method being less applicable to identifying the research context and more adequate to problem-solving. Furthermore, the adopted design was a case study, which, according to Yin (2001, p. 19), is suitable for a type of research that encompasses community sociological and psychological contexts, as well as organisational and managerial studies.

The research was conducted at a municipal school of Ilha do Baixio (Figure 1), a rural area of the municipality of Iranduba, Amazonas. This choice is justified by the school's relevance in the local educational context and its location in an environment with a strong presence of the physical and natural elements investigated.

FIGURE 1: Ilha do Baixio location map



Source: The authors (2024).

The research instrument was a structured questionnaire consisting of five questions administered to 30 students in grades 6-9 at the Santa Luzia Municipal School. All five questions were developed after conducting a field survey on the island and at the school where the research was done. Students could answer them using both written text and drawings.

These answers were categorised to analyse the data obtained from the questionnaires. Minayo *et al.* (2002, p. 21-22) emphasise that, within the scope of research that addresses relationships, processes, and situations that cannot be reduced to the operationalisation of variables, the data must be classified through categories.

The preliminary categories were reviewed by two researchers with experience in Geography and Education to guarantee the validity of the categorisation process. After this review, adjustments were made to ensure the representativeness and coherence of the final categories. In the specific case of the drawings, the analysis was guided by the same criteria as the textual answers, seeking to identify elements of the landscape, interactions between physical-natural components and symbolic representations that demonstrated the students' spatial perception.

This research was conducted in conformity with the ethical principles established by Resolution No. 510/2016 of the National Health Council (CNS), which regulates research in the Humanities and Social Sciences. Since this is a purely educational, low-risk study, without the collection of sensitive data or any form of intervention, and whose participants remained completely anonymous, the research was not submitted to a Research Ethics Committee (REC), in accordance with the exemption criteria established in said resolution.

All answers given by the students were obtained voluntarily, without any form of inducement or coercion. No personal information that could allow the direct or indirect identification of participants was collected. The names used to exemplify the responses were coded with letters and numbers (e.g., A1, A2), ensuring anonymity.

Furthermore, the questionnaires were applied with the knowledge and authorisation of the school administration, and the students' guardians were informed in advance of the research objectives and procedures. The data were used exclusively for academic purposes, respecting the participants' dignity, privacy, and autonomy. Thus, the adopted methodology enabled not only the gathering of individual and collective perceptions, but also an analysis sensitive to the specificities of the riverine context and the symbolic universe of the participating students.

Results and discussion

Ilha do Baixio is understood as "a place where people know each other and share the same space, in its various aspects" (Bocchini, 2013, p. 23). This definition reinforces the communal and affective dimension that students attribute to the space they live in, highlighting the geographicity present in their daily experiences, as highlighted by Claval (1997, p. 89-90). In view of this, students were asked what the island means to them (Table 1).

TABLE 1: What does the island mean to you and your family?

Thematic Category	Examples of Student Responses
Affective and emotional relationship with the place	- "For me, a home. For my family, a place to rest, [a place] of peace and harmony, and a good place to live." (A10) - "[...]I love living here. In the morning, when I hear the breeze, it calms me down." (A18)
Leisure and social space	- "A place to play football, play a lot, and study." (A9)
Place of subsistence and agricultural production	- "A place to live, plant, and live peacefully." (A20) - "It means home, a special place, where I have fun. For my family, it's a source of income, because of the crops." (A22) - "It's very good, because we're farmers and it's good for growing onions. Because we buy food for the home… because of agriculture." (A28)
Local identity and sense of belonging	- "A very important place. That's why we've been on this island for a long time." (A25)

Source: The authors (2024).

The answers indicate that, for 22 students, the description of the island comes from feelings stemming from their experiences with the place and their particular meanings, as described by students A9, A18, and A25 (Table 1). These responses converge with what Victória (2012, p. 1) states as the relationship between community and place, which is built during daily life and, thus, materialises into an identity.

From a pedagogical point of view, the data highlight the importance of using these perceptions as a starting point for teaching Geography. By addressing the content based on the students' lived realities and the possibilities of empowering knowledge, as proposed by Ramos, Moreira, and Santos (2004, p. 35), the teacher can mediate the development of more elaborate concepts about the physical-natural components.

For example, one way to develop the learning of physical-natural components is by associating the content with the main economic activity of Ilha do Baixio. For some students, the island is presented as a place of subsistence, as expressed by A20, A22, and A28 (Table 1).

This perception echoes the reflections of Cruz (2007, p. 8) and Ferraz (2010, p. 24), who recognise the central role of agricultural labour and the relationship with the natural environment in shaping riverine identity. Furthermore, the link between soil fertility and the Solimões River's ebb and flow patterns, while not conceptually explicit by the students, appears implicitly in their responses, revealing empirical knowledge of local environmental dynamics.

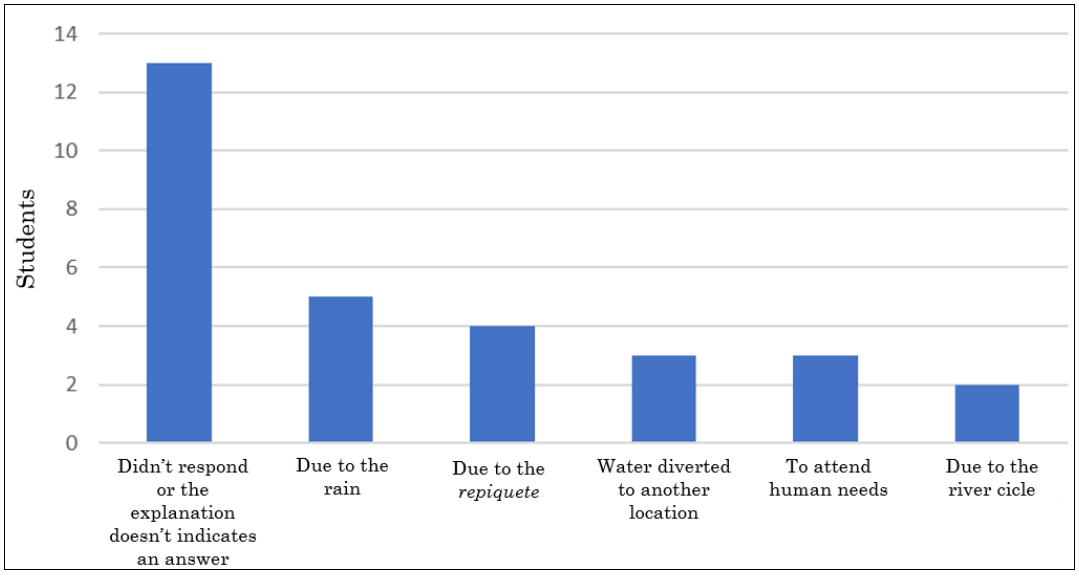
Thus, the analysis of the responses confirms the relevance of pedagogical proposals that integrate the students' empirical knowledge with scientific content, valuing geographicity as a structuring element of Geography teaching in riverine schools.

The Rhythm of the Rivers: Ebbs and Flows

The ebbs and flows of the Amazon rivers are annual phenomena. From June to November, there is the "ebb", and from December to May, the "high water" occurs – related to the rainfall dynamics in the Amazon. This cyclical nature has a direct impact on the social and economic relations of riverine communities, due to the river's multifunctional use as a means of transportation, bathing, fishing, and food for humans and animals.

To determine whether students can mobilise knowledge of the physical-natural components to conduct a geographic analysis of their place based on this geographic situation, they were asked why the Solimões River, which surrounds the island, experiences annual ebbs and flows. The responses were grouped into seven categories, presented in Figure 2:

FIGURE 2: Why does the river water rise and fall throughout the year?



Source: The authors (2024)

The results indicate a predominance of descriptive and empirical responses, strongly influenced by everyday life. A large portion of the

students were unable to explain the reasons for the river's cyclicity or provided answers unrelated to climatic factors.

For example, a group of three students explained that the river's dynamics occur as a way to meet a community need. Therefore, they cited the consequences as the cause, as student A17 emphasised when he stated that "when the river water rises, it's for the boats and canoes. And when it falls, it's for the cars, trucks, and brush." Another student reached the same conclusion, stating that "it falls for cars and motorcycles to pass, and when it rises, it's for boats and speedboats" (A23).

This perception reinforces Claval's (1997, p. 89-90) understanding of how individuals attribute meaning to space based on their concrete experiences. Therefore, students perceive the consequences of landscape change, but not their causes. From this perspective, the geographicity of these students suggests that the river's dynamics are essentially due to an anthropogenic factor.

On the other hand, geographicity conditioned four (4) students to attribute the change in river levels to the *repiquete*, based on their observation of the landscape. However, the *repiquete* only occurs during flood periods, when the river reaches its maximum limit and stabilises. After this, isolated rainfall occurs, causing the river level to rise even further, followed by a subsequent decrease (Santos; Ribeiro, 1988, p. 148). Therefore, the *repiquete* is a short-term phenomenon, not an annual event.

This confusion between the *repiquete* and the annual cycle of ebbs and flows suggests the need for greater conceptual depth in Geography teaching, especially when addressing regional hydrology. This was evident when some students stated that rivers dry up because the water is diverted to another location, as in: "because it dries up, and when it dries up, I think it goes somewhere, and when it fills up, it dries up somewhere else" (A16); and "because the river water goes to the ocean. That's why it dries up. When it rains, it fills up the rivers" (A20).

Certainly, water moves to other locations, but this happens due to the continuous movement of water and its cycle.

These responses indicate an attempt to explain the phenomenon based on observation of water movement, but still with limitations regarding the understanding of the hydrological cycle, which reinforces the findings of Cunha and Leite (2020, p. 34) regarding the problems in the teaching-learning process that create gaps between empirical experience and scientific knowledge.

However, when these gaps are bridged, students can take the best advantage of new learning potentials. For example, five students stated that the ebbs and flows of the Amazon rivers are caused by rain or lack thereof. These were the responses that came the closest to a correct understanding of the dynamics of river floods and droughts. In fact, the response of student A10 stands out, demonstrating the beginning of a connection between climatic factors and the water cycle: "because ultraviolet rays cause the water to evaporate, and when it's a rainy day, the water fills [the river]."

Lastly, some responses also highlighted how everyday experiences influence the students' perceptions of the environment. For example, student A29 relates the river's dynamics to the difficulties it entails, especially during the extreme ebb tides, stating that "the dry season is very difficult." This is due to the long distances they have to travel, the scarcity of food, and the lack of potable water for drinking and daily activities.

Thus, our results demonstrate that students, despite experiencing the phenomenon and perceiving the changes in the landscape and their social consequences during ebbs and flows, have difficulty making connections between the physical and natural components to explain them. This does not mean that students are unaware of the physical-natural components of the Amazon, but perhaps that the educational

resources available at the school are being underutilised, from the rivers' dynamics to the island's soil.

In conclusion, the need for a didactic approach that builds on local perceptions and broadens the students' conceptual repertoire is evident. Such an approach will be possible when the students' empirical experience is integrated with systematic geographic knowledge, respecting each student's geographic identity and fostering the development of a critical and scientifically grounded perspective.

Is the island good for farming?

Almost all residents of Ilha do Baixio are fishermen and farmers who cultivate small plots for subsistence, with a small surplus sold on the island or at the market held in the city hall. Notable crops include short-cycle fruit and vegetable crops such as chives, kale, lettuce, parsley, coriander, as well as cassava, manioc, corn, watermelon, and pumpkin. This activity is favoured by the island's soil type, which is classified as Eutrophic Ta Fluvic Neosol (IBGE, 2010), which Santos, Almeida, and Zaroni (2021) characterise as soils with highly active and fertile clay.

The river dynamics, including high and low tides, significantly impact this activity in the community. To determine whether students recognise the floodplain's suitability for planting and whether they can identify the factors contributing to its fertility, students were asked: Does the island have good soil for planting? Why? (Table 2).

TABLE 2: Is the island good for farming?

Thematic Category	Examples of Student Responses	Number of Students
Recognition of the land as fertile (without explanation)	- "The island has a lot of good soil for planting. I plant a lot of vegetables." (A8) - "It's very good, because we are farmers and it's good for growing onions." (A28)	25
Association between fertility and family farming activity	- "A place to live, plant, and have a peaceful life." (A20) - "It means a home, a special place where I have fun. For my family, it's a source of income, because of the farming." (A22) - "Because we buy food for the home, because of agriculture." (A28)	Included in the 25 students from the previous category (responses with specific mentions of agriculture)
Recognition of the variation in fertility between areas of the island	- "It depends, because in some parts [of the island] the land is good and in others not so much." (A2) - "The land in some parts is excellent and in others not so much." (A3)	3
Negative or mistaken perception of fertility	- "No [it's fertile], because when the river floods, it washes the land away and the soil becomes loose." (A13)	1
Did not answer or did not express an opinion on the question	No answers available in the original excerpt.	1

Source: The authors (2024)

The responses indicate that 25 (twenty-five) students consider the land good for planting, and only 1 (one) student said no. In their responses, the students only cited the high fertility of the land and mentioned some cultivated products, but they did not explain the origin of this fertility, related to frequent flooding caused by the Solimões River, which annually produces new sediment deposits, providing a layer of fertile soil for agriculture.

The learnings coming from this interrelationship can be explored through the differences in fertility in different areas of Ilha do Baixio, explaining that not all of the island has the same fertility rate as the floodplains and highlighting the river's influence on soil productivity.

In fact, three students mentioned this occurrence through geographicity, highlighting that the island has a lot of land suitable for planting, but that it does not cover its entirety, as explained by student A2 (Table 2). From this perspective, the student demonstrates empirical knowledge of the land, knowing that areas flooded during the rainy season are more fertile due to the organic matter and nutrients carried by the rivers, while the higher elevations that do not flood have lower fertility. This perception is corroborated by student A3 (Table 2).

In contrast, only student A13 pointed out that the soil is not fertile (Table 2). In this example, the student claimed that the island lacks high fertility due to the leaching process and the flood season. Certainly, when there is a flood, planting and harvesting become unviable. However, it is precisely the river's flooding that is responsible for the soil's agricultural potential, resulting from the natural fertilisation of the river waters. This scenario reinforces the need for pedagogical practices that promote the connection between local and scientific knowledge, expanding the students' perception of the environment where they live.

The island is shrinking!

The intense dynamics in the Solimões River causes the phenomenon known regionally as "*terras caídas*" (fallen lands), which consists of the excavation produced by river waters, causing the intense undermining of banks and potentially displacing immense blocks of land that float like islands (Guerra, 1993, p. 408).

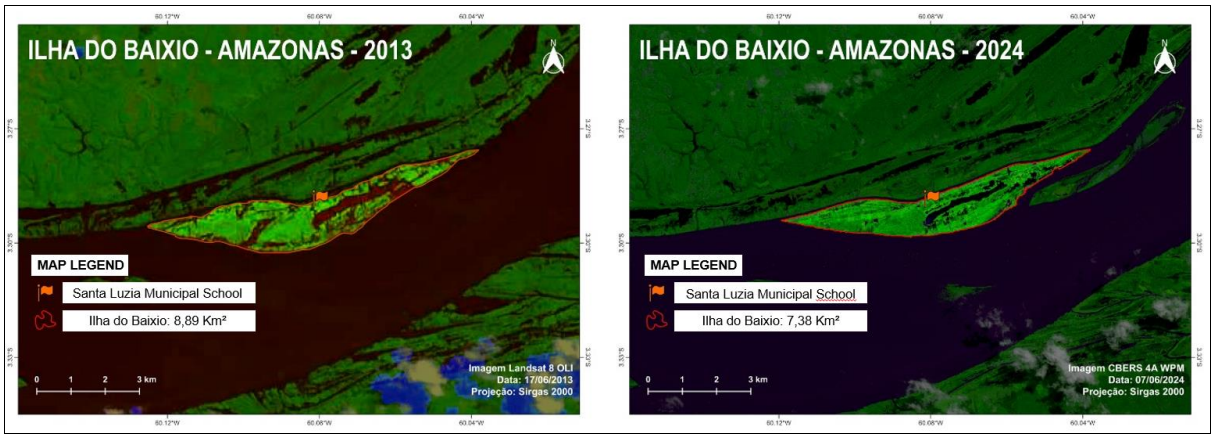
Ilha do Baixio has a longitudinal spatial dimension, located in the lower reaches of the Solimões River, which favours the deposition of sediments from upstream. However, because it is a recent sedimentary deposit, it is susceptible to intense sediment transfer due to erosion, such as

fallen lands. This phenomenon is mentioned by the school's Geography teacher, who states:

> Twenty years ago, when Mr. (anonymous) arrived here, this community was different; it was larger. So, over time, the river eats away at the land. Even more so in the upper part. There were beaches in the upper part. Not today, there are no beaches there anymore. Only the river. (Geography Teacher, 2023).

The teacher describes the event that, in recent years, resulted in a reduction in the island's area of approximately 1 km, as seen in Figure 3.

FIGURE 3: Comparative analysis of the Ilha do Baixio area



Source: The authors (2024)

The consequences for residents due to the fallen lands identified by Carvalho (2006, p. 128-133) include reduced soil properties, loss of crops, the need to move houses, homelessness, difficulty accessing the port, the risk of burial and loss of canoes, and even the possibility of deaths.

To assess whether students identify this phenomenon and its causes, they were asked what is causing the island's reduction in size. The responses were classified into four categories, as presented in Table 3. It shows that 13 (thirteen) students are unaware of the erosion

process occurring upstream of the island, even though the phenomenon was mentioned by the students' teacher during the interview and is a recurring issue due to the relocation of some families from the island to the city after losing their homes and having their land reduced by the action of the river water.

TABLE 3: What is causing the island's reduction in size?

Thematic Category	Description	Examples of Student Responses	Number of Students
Erosion and Sediment Transport	Students who related the island's shrinkage to bank erosion and sediment displacement by the river.	- "When it floods, the current sweeps away the land, making one side larger." (A2)	11
River drought	Students who attributed the island's shrinkage to a drop in water levels, confusing the phenomenon with the ebb tide.	- "Because of the drought." (A5, A9 and A24).	4
Anthropogenic Action	Students who mentioned human intervention or some form of direct human action as the cause.	- "Because the number of people increases on one side and decreases on the other." (A17).	1
Does not know/Did not answer	Students who stated they do not know the cause or did not answer the question.	- "I don't know" or no answer given	13

Source: The authors (2024)

Erosion and sediment transport are considered the main cause of the island's reduction in size by 11 (eleven) students, as can be seen in the example in Table 1. Student A2, for example, mentions both the erosive action of river water and the sediment deposition process.

Based on their everyday knowledge, some students are able to explain the process of lateral erosion, with answers referring to the stages of this phenomenon: landslides, landslips, and collapses (Carvalho, 2006, p. 86-90). The best way to build knowledge about this

process is through an integrated observation of the relationship between its components and the landscape, as suggested (Cunha; Leite, 2020, p. 36). However, conducting this activity is not so simple, given some difficulties in moving to the fallen areas on the island.

Furthermore, a group of five students attributed the river drought as the cause of the island's shrinkage. The phenomenon of fallen lands is more active during the low-water period, particularly the collapse process. However, this response fails to identify the impact of the river as a contribution to this phenomenon.

It is also noteworthy that one student (A17) does not answer the question but describes the impact of erosion occurring on the island (Table 3). This demonstrates that the student identifies the displacement process occurring on the island – from the west, where the erosion process is most active due to the river's current, to more central or eastern locations. However, he does not establish a relationship between physical and natural components.

The results show the importance of geographicity. Even if the students were unable to correctly formulate a well-structured response regarding a given process, they can, through perception alone, partially describe or understand the practical functioning of the interaction between the physical and natural components.

However, it is a cause of concern that many students lack a basic understanding of this phenomenon – something that can cause harm to these individuals' lives, whether through economic impact or even tragedy. Despite this, geographic location allows even those terms far removed from everyday vocabulary to be understood, and the forest should be the primary teaching resource for these students.

Final Considerations

The research identified the students' perceptions of the physical-natural elements of the Amazon, verifying if the interactions between those elements are understood by them. The data presented throughout this study demonstrate that the participating students have empirical knowledge regarding the physical-natural components, based on their daily experiences.

Thus, when presented with geographic situations occurring on the island, the students perceive erosion, changes in river levels, and soil fertility; they describe the changes in the landscape and their consequences. However, they have difficulty explaining the causes behind these phenomena, which are multifactorial and require an understanding of the integrated action between the physical-natural components. The knowledge acquired through geographicity has little connection with scientific knowledge, with many students analysing the geographic situations presented in the questionnaire in a fragmented manner, without relating the interactions between the physical-natural elements.

This is due to the fact that classes lack contextualisation of the Geography content in the school's context, as the curriculum and textbooks are urban-centric. Therefore, it is necessary to enhance the knowledge built on geographicity, combining it with scientific knowledge through teaching strategies that promote the integrated analysis of geographic facts and situations.

For future research, we suggest further studies on the relationship between geographicity and the learning of physical-natural content, expanding the number of schools analysed and exploring different teaching methodologies. Another research possibility is to evaluate the impact of contextualised pedagogical interventions on the development of geographic reasoning among riverine students.

Aligning the school curriculum with the students' prior knowledge and their experiences with scientific knowledge not only contributes to the development of geographic reasoning but also to the principles of rural education.

In short, this study contributes to highlighting the importance of a contextualised curriculum, pedagogical practices that value local knowledge, and teacher training focused on the Amazonian reality. Such measures are essential for riverine students to develop a more critical and integrated understanding of the space where they live, strengthening their capacity for geographic analysis and civic engagement.

Bibliographical References

ALCÂNTARA, M. I. P. *Elementos da floresta e ensino de ciências: proposta metodológica para ensinar ciências na área rural amazônica*. 2008. 138 f. Dissertação (Mestrado em Ensino de Ciências) - Universidade do Estado do Amazonas, Manaus, 2008.

BOCCHINI, A. G. Mulheres de Santa Luzia da ilha do Baixio: modo de vida na várzea do Baixo Solimões. 2013. 131 f. Dissertação (Mestrado em Ciências do Ambiente e Sustentabilidade na Amazônia) – Universidade Federal do Amazonas, Manaus, 2013. Available at: https://tede.ufam.edu.br/bitstream/tede/4240/2/Disserta%C3%A7%C3%A3o%20-%20Ana%20Gouv%C3%AAa%20Bocchini.pdf. Acesso em: 20 jul. 2024.

BRASIL. *Base Nacional Comum Curricular*. Brasília: MEC, 2018.

BRASIL. *Resolução n.° 510, de 7 de abril de 2016*. Brasília, DF: Ministério da Saúde, 2016.

CARVALHO, J. A. L. *Terras caídas e consequências sociais*: Costa do Miracauera, Paraná da Trindade, Município de Itacoatiara-AM, Brasil. 2006. 142 p. Dissertação (Mestrado em Sociedade e Cultura na Amazônia) - Universidade Federal do Amazonas, Manaus, 2006.

CLAVAL, P. As Abordagens da Geografia Cultural. In: CASTRO, I. E. (Org.); GOMES, P. C. C. (Org.); CORRÊA, R. L. (Org.). *Explorações geográficas*: percursos no fim do século. Rio de Janeiro: Bertrand Brasil, 1997, p. 89-115.

COPATTI, C.; CALLAI, H. C. O ensino de Geografia em Educação do Campo e o Uso do Livro Didático. *Revista Contexto & Educação*, Ijuí, v. 33, n. 105, jun. 2018. DOI: https://doi.org/10.21527/2179-1309.2018.105.222-247

CRUZ, M. J. M. *Territorialização componesa na várzea da Amazônia*. 2007. 260 p Tese (Doutorado em Geografia Humana) - Universidade de São Paulo, São Paulo, 2007. Available at: https://www.teses.usp.br/teses/disponiveis/8/8136/tde-03122007-112229/pt-br.php. Accessed on March 17, 2024.

CUNHA, L. F. F.; LEITE, C. M. C. Os componentes físicos-naturais do espaço e a geografia escolar. *Ensaios de Geografia*, Niterói, v. 6, n. 11, p. 32-54, mai./ago. 2020. DOI: https://doi.org/10.22409/eg.v6i11.40945.

DUARTE, F. R.; FRAXE, T. J. P.; NOGUEIRA, A. R. B. A geograficidade e percepção ambiental de estudantes, moradores de várzea do Rio Solimões. Terceira Margem Amazônia, Manaus, v. 6, n. 15, p. 74-89, jul/dez 2020. DOI: https://doi.org/10.36882/2525-4812.2020v6i15p74-89.

FERRAZ, L. R. *O cotidiano de uma escola rural ribeirinha na Amazônia*: práticas e saberes na relação escola-comunidade. 2010. 256 p. Tese (Doutorado em Ciências na área de Psicologia) - Universidade de São Paulo, Ribeirão Preto, 2010.

GUERRA, A. T. *Dicionário geológico-geomorfológico*. 8 ed. Rio de Janeiro: IBGE, 1993. 443 p.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA (IBGE). *Estado do Amazonas - Pedologia*: Mapa exploratório de Solos. Brasília: IBGE, 2010. 1:1.800.000. Available at: https://www.ibge.gov.br/geociencias/cartas-e-mapas/mapas-estaduais/15828-pedologia-do-estado-de-ro-rr-to-ac-am-ap-ma-mt-pa-e-rs.html. Accessed on March 22, 2024.

MAFRA, M. V. P. *Elementos físicos-naturais da Amazônia no ensino de geografia*: percepção de alunos e professores da cidade de Manaus, AM. 2019. 160 p. Tese (Doutorado em Ciências) - Universidade Estadual de Campinas, Campinas, 2019.

MINAYO, M. C. S. (Org) *et al. Pesquisa social*: Teoria, método e criatividade. 21 ed. Petrópolis: Editora Vozes Limitada, 2002. 80 p.

RAMOS, M. N. (Coord.); MOREIRA, T. M. (Coord.); SANTOS, C. A. (Coord.). *Referências para uma política nacional de educação do campo*: caderno de subsídios. Brasília: Secretaria de Educação Média e Tecnológica, 2004. 48 p.

SANTOS, H. G.; ZARONI, M. J.; ALMEIDA, E. P. C. *Neossolos Flúvicos*. Portal Embrapa. Brasília, 2021. Available at: https://www.embrapa.br/agencia-de-informacao-tecnologica/tematicas/solos-tropicais/sibcs/chave-do-sibcs/neossolos/neossolos-fluvicos. Accessed on March 22, 2024.

SANTOS, U. M.; RIBEIRO, M. N. G. A hidroquímica do rio Solimões-Amazonas. *Acta Amazônica*, Manaus, v. 18, n. 3-4, p. 145-172, 1988. DOI: https://doi.org/10.1590/1809-43921988183172.

SILVA, G. J. F. *et al.* As temáticas físico-naturais na geografia escolar: prática docente e proposição de recursos para o ensino. *Revista de Geografia*, Juiz de Fora, v. 12, n. 1, p. 36-61, 2022. DOI: https://doi.org/10.34019/2236-837X.2022.v12.38896.

VICTÓRIA, C. G. Mergulhando nos rios do cotidiano: Escola e Cultura na vida dos jovens de uma comunidade ribeirinha no Amazonas. *In*: SIMPÓSIO INTERNACIONAL SOBRE A JUVENTUDE BRASILEIRA, n. 5. 2012. *Anais [...]* Recife, 2012.

YIN, R. K. *Estudo de caso*: planejamento e métodos. 2 ed. Porto Alegre: Bookman Editora, 2001. 205 p.

Received in November 2024.

Approved in July 2025.