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GEOGRAPHIC REASONING AND CLIMATOLOGY TEACHING IN HIGH SCHOOL: WITH AND BEYOND IMAGES

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Abstract: This article aims to present a proposal for teaching practice in Geography, with an emphasis on Geographic Climatology, through the use of photographs to interpret climatic phenomena, using these images as a trigger (or motivating elements) to awaken reasoning aware of the topics covered in the classroom. This didactic experience was carried out with students in the 1st year of Technical High School at the Federal Center for Technological Education of Minas Gerais (CEFET-MG), based on the Meaningful Learning of Ausubel and other theorists, highlighting the importance of teaching-learning applied to the reality experienced. by students in their daily lives, seeking to bring theoretical and abstract concepts closer together for a more effective understanding combined with student practice. As a methodology, two teachers from the Department of Geosciences (DGEO), at that institution, supervised a didactic-pedagogical dynamic with 7 (seven) classes, using as a pedagogical resource photographs that portrayed specific climatic phenomena (such as the melting of snow in the desert of Sahara). The aim was to stimulate collaborative learning among its students, seeking to break with the initial view of the fact that, for many students and even teachers, learning about these climate topics is often considered “abstract and complex”. To conclude this didactic proposal, there was a discussion and analysis of the results, considered positive and significant by the teachers, highlighting the greater involvement and development of autonomy of the students involved in this topic.

Keywords: Teaching Geography; geographic reasoning; images/photographs.

INTRODUCTION / DEVELOPMENT

Pondering teaching-learning in Geography and emphasizing the development of geographic reasoning in education is a daily task for all of us teachers. And, as an additional challenge, they must also seek to reduce the gap between the school's scientific language, especially on more complex topics such as Climatology, as such a gap can lead to a possible lack of interest in the topic, generally considered inaccessible and /or very difficult for students, especially when its articulation with students' daily lives is not highlighted, within the perspective of meaningful learning.

For Jerome Bruner (1978, p. 18), in the education process we must reflect on “what are we going to teach, and for what purpose?”, stating that “the fundamentals of any subject can, in some way, be taught to whoever it is”. Therefore, when we talk about teaching-learning processing, everyone is a student and researcher. According to Coll (1995, p. 149), perhaps “it would be more appropriate to try to ensure that the learning they carry out is, at each moment of schooling, as meaningful as possible”. Therefore, the purpose of this article is to present a didactic-pedagogical strategy based on research-based teaching for the construction of reflective and meaningful knowledge, in relation to climatology taught in high school, based on the use of images/photographs of atmospheric phenomena. Thus highlighting the necessary link between the theoretical-methodological elements and the practice itself, proposing to favor the discussion on School Geography in basic education.

This proposal was applied to students in the 1st year of Integrated High School at CEFET-MG, in Belo Horizonte - MG, in 7 (seven) classes in total. The main question consisted of how photographs/images can assist in the teaching-learning of climatology,

allowing arguments to be made beyond the initial curiosity of each chosen photograph, transcending the pedagogical resource used. By undertaking such an exercise, according to David Ausubel (2001), students are able to recognize the resources made available as “potentially significant”, at the same time that they continually enrich and reorganize their cognitive structures when they interact with such resources through their experiences, and thus, they are able to develop their own deductions, continually improving them in the course of activities through these individual rearrangements and through the dialogism fostered in the constructive actions of teaching-learning. For this author, the distinction between the creation of new instructions based on already existing and important formulations in the student’s cognition system occurs because there is a hierarchy within the cognitive structure, with more comprehensive concepts, others less so, some more particular, others more general.

Therefore, when significant learning takes place, greater integration between concepts is perceived, making them more in-depth and defined. In view of this, the role of the teacher is essential to awaken students’ interest in teaching and their personal development, and it is important to seek new methodologies and teaching resources that enable greater student participation in the construction of their own knowledge, making a continuous effort about researching and producing more relevant methodologies that can create a “bridge” to understanding the concepts and contents covered, understanding each of them as didactic potential. For this task, it is necessary to have real knowledge of the life history of students, in order to propose dynamics that combine the experiences, daily life and mutual interests of students and teachers.

Specifically, about the teaching of Climatology, as already highlighted by Steike

et al. (2014), there is a need for teachers to use more visual resources, such as illustrations, graphs and maps, to facilitate the understanding of atmospheric phenomena, given the higher level of abstraction required to understand climate phenomena, in addition to showing for students that Climatology is present in their daily routine.

Especially in the context that, according to Sennett (2003, cited by Allocca and Fialho, 2021), “human beings find themselves increasingly distant from the cycles of nature, which generates a superficiality in modern society, or even a distancing from natural cycles that disorganize chronological time”. And, because of this, in the words of Collischon and Fialho (2007), “people are uncommitted to observing the weather and seasonal variations”, exemplified by the popular saying: “Come sun, come rain, I’m going to work”, which demonstrates the independence of human activities from local climatic conditions. In other words, it is important that the teacher combines these desires with the students’ previous notions about their conceptions about weather and climate, and at what level they are in terms of discerning atmospheric dynamics and the importance of this knowledge. for our lives.

The teacher-researcher, in addition to his theoretical contribution, always investigates possibilities, and in this vein, seeks to know and positively appropriate new instruments and languages, which happened in the same way, in this practice. And, to reach geographic reasoning, students demand to transform information into knowledge, from common sense to scientific knowledge, redefining them and elaborating their concepts. This conceptual journey is in-depth because, to achieve it, it requires greater abstraction. If the student is unable to process this generalization, they will not be able to see life from a more comprehensive and systemic perspective,

where natural phenomena, forms of life and society interact and are complementary.

Finally, it is noteworthy, in the authors' perception, that the gradual analysis of the images verified in these activities and its correlation with the students' prior knowledge contributed to the development of climatological literacy that went beyond this express form of language, enabling them to carry out different recognitions of reality, both individual and collective. Emphasizing the value of sharing discoveries, generating active dialogue and cooperation in countless learning levels, making them aware of the acquisition of their own knowledge; and the value of teachers' mediation in guiding didactic processing and encouraging students' autonomy throughout the educational process. The theoretical subsidies for the work are found, particularly, in the semiotics of image/ photography and in the ideas about education by Jerome Bruner and in the theories of Meaningful Learning by David Ausubel and Historical-Cultural by Lev Vygotsky, and conceptually anchored in classical and well-known references on Climatology and Geographic Climatology, such as Ayoade (2010), Conti (2011), Mendonça (2017), among others.

THE IMPORTANCE OF GEOGRAPHIC REASONING AND MEANINGFUL LEARNING TO DEVELOP STUDENTS' CRITICAL THINKING AND THE CONNECTION WITH GEOGRAPHIC CLIMATOLOGY AND THE PERCEPTION OF NATURAL PHENOMENA:

Teaching often implies constantly stimulating conscientious reasoning and, when approaching geographic knowledge, this premise could not be different. Given all the uncertainty and challenges in

differentiating information and knowledge in the current sociocultural fabric, especially in an era marked by so-called “*Fake News*”, the importance of learning through the collective is even more highlighted. In other words, the importance of “collaborative and meaningful learning” is increasingly highlighted, carried out through the exchange of experiences and knowledge shared in its multiple interfaces, whether face-to-face or virtual. In this sense, the school environment is one of the environments where we carry out part of these complex and interdependent relationships. According to Clifford Geertz's perspective, “the forms of society are the substance of culture” (Geertz, 2008, p. 20).

There is also a cultural character to knowledge and the way in which it is appropriated, in the same way as the elaboration of the sense of oneself, positioned in the space of culture and in historical time (Bruner, 1997). And also in Geertz's assessments (2008, p.38): “Just as culture shaped us as a single species — (...) so it shapes us as separate individuals. This is what we really have in common— neither an immutable subcultural being nor an established cross-cultural consensus.” In other words, culture is constantly changing and in education, from this perspective, there is no single explanation for each question and there will always be room for new doubts and objections, as coexistence is constant and dialectical.

Paulo Freire states that in terms of Brazil, we are a “partial society”, undergoing transformation, and that the ideal “would have to be a critical and criticizing education”. Providing the opportunity for the “passage from naive transitivity to critical transitivity”, in order to “capture the challenges of time, putting the Brazilian man in a position to resist the powers of the emotionality of the transition itself.” (Freire, 1967, p. 86). And the same author (Freire, 1967) explains that

“no one ignores everything, no one knows everything”, announcing how the student (man/subject) absorbs reality and thinks, further:

Man, however, does not capture the reality, the phenomenon, the pure problematic situation. When capturing, along with the problem, with the phenomenon, it also captures its causal links. He grasps causality. The understanding resulting from the capture will be all the more critical as the apprehension of authentic causality is made. And it will be so much more magical, to the extent that it is done with a minimum of apprehension of this causality. (Freire, 1967, p.104-105).

Such symbiosis can be exemplified in the approach to content related to the Geographic Climatology discipline, as it seeks to reconcile technical knowledge about climate and weather with the systemic perspective of environmental science, bringing understanding about the different forms of life on the planet and its distribution into people’s daily lives. The very concept of climatic rhythm, brought by Monteiro (1971), elaborates the Rhythmic Analysis in Climatology based on the concept of climate advocated by Max Sorré, in the middle of the 20th century, initiating a new paradigm for the study of climate based on rhythm.

In the words of Mendonça & Tavares (2010)

Considering climate as a geographical phenomenon, climatological rhythmic analysis opposes the abstract and unrealistic conception of climate as an average state of the atmosphere and seeks to investigate the sequential mechanism of different types of weather and explain the main fact proposed by the theory: the current climate rhythm, that is, the current climate. (Mendonça & Tavares, 2010, p. 1-2)

In the context of classrooms, in general, it is very common for students and teachers of basic education to consider the concepts of Climatology to be quite theoretical and even

hermetic, explaining a difficulty in correlating theory and practice, and thus realizing that there are many connections and applications of these concepts in your own daily life and application in real life. Barros and Souza (2013) point out that:

The reason for this is that the study of Climatology focuses on a longer period of time than Meteorology, however, it does not refrain from analyzing atmospheric elements, but checking the processes in a continuous, dynamic, statistical way and with a geographical perspective. (Barros; Souza, 2013, p. 1).

This way, we understand the importance of this school education being more interactive and meaningful, based on experience, creation, execution and development of projects that stimulate creativity, in which students are able to relate the different contents worked on, in a transversal, so that this way increases the interest and motivation of students, both at school and at university. And, to verify this argumentative discourse, we must privilege the student’s curiosity on the one hand, foreseeing in this particularity a benefit to be used educationally, in a good sense. And on the other hand, supported by theoretical references and careful planning, the need to highlight the main attribution of the educator, which is the intermediation of the student’s cognitive development so that he emerges as an individual into the world and in a conscious way. Thus, it is assumed that the teacher will listen more than he will speak, urging students to carry out their generalizations until they reach their scientific thinking.

On this journey, they will learn from each other what Bachelard (1996) calls “the fundamental pedagogical principle of the objective attitude”, thus saying: “*Whoever is taught must teach*. Whoever receives instruction and does not transmit it will have a spirit formed without dynamism or self-

criticism” (...). Since, “this type of instruction crystallizes in dogmatism the knowledge that must be an impulse for discovery” (Bachelard, 1996, p. 300). Furthermore, this opinion is clarified in Bachelard’s (1996) statement regarding his work as a teacher, below:

I direct them towards the paths of abstraction, striving to awaken a taste for abstraction. Anyway, I think that the first principle of scientific education is, in the intellectual realm, this asceticism that is abstract thinking. Only it can lead us to master experimental knowledge (Bachelard, 1996, p.292).

With regard to education, this understanding centers on learning through discoveries and questions, where students have an active attitude in composing their own assessments. In the words of Jerome Bruner, we aim for “a renewal of concern for the quality and intellectual objectives of education”, without forgetting, however, the “ideal that it must be a means of preparing well-balanced men for a democracy” (Bruner, 1978, p.1). Consequently, in Bruner’s Cultural Psychology proposal, the value of autobiography is seen as an ally of teaching-learning. Education is shown as an area where experiences converted into narratives can be revisited and re-elaborated, highlighting what is relevant and cultural exchanges, leaving the curriculum more congruent and dynamic, and this possibility must not be omitted (Bruner, 2001). He, ahead, explains what these “narratives” would be”:

Thus, narratives are a version of reality whose acceptability is governed only by convention and “narrative necessity,” not by empirical verification and logical precision, and, ironically, we are under no obligation to call stories true or false. (Bruner, 1991, p.4)

Narrative considerations, just as rational and scientific considerations are not compartmentalized in human beings, are general and comprehensive, and will vary

depending on the culture of each individual. However, in the educational course, due to the segmentation of knowledge into subjects, there is a tendency for each subject to remain in “its square” and the student is unable or has difficulty in appropriating these instructions as a whole.

However, today the world asks the individual precisely for this ability to extrapolate reality and contexts – scrutinizing it, and the school, from an interdisciplinary/transdisciplinary perspective, giving significance to what is taught. Therefore, we use, again, Bruner’s assertions, on the coexistence between culture and the production of meanings, shortly afterwards:

Producing meaning involves situating encounters with the world in their appropriate cultural contexts in order to know “what they are about.” Although meanings are “in the mind”, they have their origins and their importance in the culture in which they are created. It is this cultural location of meanings that guarantees their negotiability and, ultimately, their communicability. This is not about the existence, or not, of “particular meanings”; the important thing is that meanings form a basis for cultural exchange. In this view, knowing and communicating are, in their nature, extremely interdependent, in fact practically inseparable. (Bruner, 2001, p.16)

Therefore, taking Helena Callai’s statements on High School Geography (1999), it is necessary to move away from the fragmentation of content and militant discourses, and seek to “think about space” for the implementation of meaningful teaching, seeking a conceptual support, constructed procedurally, that allows the student to discuss what is worked on in the classroom, and then position themselves beyond superficiality. And Callai (1999) continues promptly:

The content of school Geography, currently, has been to describe some places and some problems, without being able to think about

space. Thinking about space means giving the student the conditions to build an instrument that is capable of allowing them to search for and organize information to reflect on. Not just to understand certain content, but to use it as a possibility to build your citizenship. (CALLAI, 1999, p. 75).

Therefore, Geography must seek to transpose the concepts covered in the classroom to the students' experiences. This is because, when the student incorporates such knowledge and concepts into their lives, they begin to experience them daily, being able to "discover the world". Considering your individual perception and putting yourself in your place, through the interpretation of the mechanisms and forces that modify space, according to the interests of societies and the dynamics of nature, which may (or may not) be negatively enhanced/ positively by human actions.

However, it is not enough to make a lucid judgment of reality, as thoughtful discernment must have an impact that involves changing daily habits and attitudes, assuming tangible opinions and attitudes. This progress as an individual/subject with conviction happens throughout life and in all environments. And the school also has a capital importance in the constitution of a conscious student/subject.

In such a context, all knowledge is put to the test and continually questioned by the teacher. Kuiava and Régnier (2012), say about the formation of a scientific education, at the forefront:

The break with what has already crystallized is necessary for the construction of new knowledge. Educating yourself does not consist of acquiring new knowledge, in a process of accumulation, but of always new knowledge, with a critical, dynamic and reflective perspective. The knowing subject is not a receptacle of knowledge already produced and which is reheated in the classroom. (Kuiava; Régnier, 2012, p.04)

In harmony with David Ausubel's ideas, we use his definition of concepts in learning as: "concepts as objects, events, situations or properties that have common specific attributes and are designated by the same sign or symbol" (Ausubel, 2000, page: two). In conceptual assimilation, which is the most common format in both children and young people, "the specific attributes of the concept are acquired through direct experiences, i.e., through successive phases of hypothesis formulation, testing and generalization" (Ausubel, 2000, p.2).

Without a doubt, with the cognitive evolution of the child/young person, "new concepts are acquired (...), since the specific attributes of new concepts can be defined using new combinations of existing referents, available in the cognitive structure" of them (Ausubel, 2000, p.2). This path between conceptual assimilation and meaningful learning can be enhanced by reconciling previous foundations, motivation, learning through investigation and sharing of knowledge, among other factors.

In this didactic *praxis*, photographs of natural phenomena with a climatological focus were applied as motivating elements. In the view of John Berger (2017), photography is a "still image" in which the photographer only makes the decision "about choosing the moment to be isolated". "But it is this apparent limitation that gives photography its singular power. What it shows invokes what is not shown" (Berger, 2017, p. 40). One of the camera's benefits, "what the eye can never do, is *fix* the appearance of that event". (...) It "saves a set of appearances from the inevitable (...)" (Berger, 2017, p. 77). Berger then continues this position:

But unlike memory, photographs by themselves do not preserve meaning. They offer appearances – with all the credibility and gravity that we normally attribute to appearances – separated from

their meanings. Meaning is the result of the faculties of understanding. And understanding happens over time. Only what he narrates can make us understand. (BERGER, 2017, p.77)

This way, it is possible to perceive the “immutability” of photography, which can be adopted in the classroom, to assist in the transmission of knowledge and geographic studies. In the same way that Geography is found in an atlas or on a globe, for example, it is not reduced to these instruments that represent parts of its field of study.

The search for the essence of each photograph is carried out during the teaching practice, when the teacher guides the methodological succession, and tries to stimulate the ties between the students’ subjective narratives and scientific knowledge, thus leveraging geographic reasoning. This will happen when students grasp the appearance of the event recorded in the photograph, locating it in time and space, filling in the gaps of what is not materialized there. As Berger (2017) emphasizes: “a photograph is not just an image (like a painting is an image), a representation of reality. It is also a trace, something directly reproduced from reality, a footprint (...).” (Berger, 2017, p. 77)

The domain of the “footprint”, existing in photography or another medium, and its exercise of reflexive transition, is what Merleau-Ponty (1999) defines as “spatializing space”, where from the point of view of the phenomenology of perception, “space is prior to its alleged parts, which are always cut into it. Space is not the environment (real or logical) in which things are arranged, but the means by which the position of things becomes possible” (Merleau-Ponty, 1999, p. 328). Merleau-Ponty clarifies this formulation beyond physical space and its concrete relations, successively:

We would like to compare it here, not with

the technical instruments that modern physics has given itself, but with our experience of space, the ultimate instance, according to Kant himself, of all knowledge relating to space. It would be true that we are faced with the alternative, either of perceiving things in space, or else (if we reflect, and if we want to know what our own experiences mean) of thinking of space as the indivisible system of acts of connection that a constituent spirit carries out. ? Does not the experience of space found its unity by a synthesis of an entirely different kind? (Merleau-Ponty, 1999, p. 328-329)

For practices to take place in a spontaneous circumstance, there needs to be dialogue between teachers and students, in which their lived experiences are taken into consideration in the educational development. Nominations may vary, autobiographical narratives (Bruner, 1991), prior knowledge (Ausubel, 2001), the centrality of the student/subject and their knowledge, among others. The teacher/educator has the latent attribute of transforming his praxis, one of its bases lies in educational intentionality and rhythm, seeking creativity with a connection. Carlos Brandão, elaborates on this topic, promptly:

Let us dare to slow down learning. Let us know how to delay what-to-know-to-do in the name of how-to-live-to-be. Give more and better time to slow and humanized school progressions, and open more moments to the poetic as opposed to the prosaic; to reverie as opposed to the conceptual (as in Gaston Bachelard); to the lovingly dialogical, as opposed to the selfishly monological; to the *poietic* = the construction of poetry-of-the-self in the person of each student, as opposed to the pragmatic = the mere instruction of the individual to produce only... things. (Brandão, 2019, p 19)

Through Vygotsky (1998), we contemplate the intimate articulation between the motivational impulses inherent to the culture where children/young people live,

the function of language and its structuring carried out by them and those with whom they interact, and the mechanisms elaborated and resulting from these interrelations. During the teaching activities in the classroom, it was possible to observe the student's psychological and social development, their potential for organization, behavior and coexistence with other colleagues. In the enjoyment of speech and its articulation, generating exchanges and advances in learning.

METHODOLOGICAL PROCEDURES

Despite knowing that there is no one-sidedness in the way of approaching geographic content and its various themes and transversalities, it is necessary to describe how the operationalization of this teaching practice occurred, more as a guiding source that allows the most diverse adaptations and contextualizations in relation to the other diverse geographic themes. Therefore, following this need to carry out a practice with relevance, the main points exercised in this didactic-pedagogical idealization were:

- Probing prior knowledge about climatology in each class;
- Dialogue with students about the didactic proposal, suggestions for instruments to be used;
- The initial planning of the practice: objectives, methodology, teaching materials used, number of classes available, subjects to be covered in the work (...);
- Defining the work to be carried out, choosing the groups, scheduling dates, rules for the exhibition, debate and final reports for each group;
- Consultation carried out by students on the *internet*, in libraries, in museums, with the choice of photographs concerning

the topics to be studied – meteorological phenomena; climatological;

- The choice of meteorological/climatological phenomena to be investigated by students, freely. Just be careful not to have repetitions, if possible;
- The inventory of photographs related by each group: source and location of the photographed event, characteristics of the landscape and natural phenomenon portrayed, hypotheses/questions regarding what happened (principles of causality, extension, analogy, connectedness, activity...);
- Forwarding the photographs selected by each group to the teachers (Figures 1 and 2), in advance, via email (maximum 3);
- Prior analysis of photographs by teachers;
- Printing of the chosen photographs – in color and standard size;
- The exhibition of the chosen photographs, previously numbered, on a wall;
- And, finally, the examination and consideration by groups of the photographs displayed, identification of each phenomenon photographed and survey of possible hypotheses for what happened;



SNOW COVERS THE SAHARA DESERT

Snow covered the dunes in the town of Ain Sefra, Algeria, known as the gateway to the desert. The city of Ain Sefra, in Algeria, began to record snow in the early hours of Sunday (7), giving children the opportunity to chase each other down the slope.



Photographs 1 and 2 – Example of photographs used (front and back)

Source: Folha, 2021.

<https://f5.folha.uol.com.br/voceviu/2018/01/dunas-do-deserto-do-saara-aparecem-cobertas-por-neve.shtml> (Accessed: 08/08/2021)

- To facilitate reflections, the photographs were projected in the classroom;
- Each group must only analyze, at first, the photographs not chosen by them, and when in the debate, their photos were being investigated, they could make their contributions to enrich the discussions;
- When displaying numbered photos,

they were located using geographic coordinates on maps;

- With the collaboration of the teachers, the students made comparisons between the investigations carried out on the photographs by the groups, prior to the debate, with the subsequent conclusions, making adjustments, depending on each case;
- At the end of the debate, the groups presented their report at the round table;
- Complementary exercise;
- Collective considerations about the project.

Next, the results and the main topics of discussion raised by the students themselves after this pedagogical practice were presented, with an emphasis on the development of geographic reasoning and strategies aimed at meaningful learning.

REFLECTIONS ON THE CLIMATE PHENOMENON

The title of the report “Dunes in the Sahara desert appear covered in snow”, published on January 7, 2018 on a Folha de São Paulo website, already arouses the student’s curiosity about questioning the occurrence of the climatic phenomenon “snow” in a location not conducive to its occurrence (in the Sahara desert), due to the combination of climatic factors and climatic elements that predominate in the location, located in a hot desert in the middle of the African continent.

The strangeness of the occurrence and its very exceptionality - as it is a very rare phenomenon in Climatology - in themselves, already contribute to awakening the critical and questioning thinking of students, who seek answers to the occurrence of the phenomenon based on plausible and that help you understand it rationally. Initially, the correlation between temperature and the global

climatic latitudinal range is in opposition to what is usually taught in the classroom – after all, it is the intertropical range, the hottest zone on the globe – therefore, the occurrence of snow, which requires very low temperatures on the surface and in the atmosphere to occur. However, the “snow in the Sahara desert”, according to meteorologists, occurs due to the occurrence of strong cold fronts, with cold and humid winds, which reach southern Europe in January (the height of the winter solstice in the Northern Hemisphere) and which may be associated in some way with global climate change. This is because it had only occurred 4 times in historical records (in 1979, December 2016, January 2017 and January 2018).

This year, it occurred again in Algeria, in January, with thermal records of -3°C minimum and 50°C maximum, always with little durability in the landscape, but which, due to the frequency in which it is occurring, starts to arouse concern about the behavior of thermal averages projected for the planet in the future, generally associated with anthropogenic transformations on the landscape, and as a consequence of air pollution and production and consumption relations in current society.

RESULTS AND DISCUSSION

The procedures reported in this work were created based on suggestions from the students themselves, with the aim of generating a participatory and autonomous learning scenario, and at the same time, instigating.

Articulating purposes with methodology, teaching methods and strategies that fostered meaningful learning (Ausubel, 2000), resulting in geographic reasoning achieved by students. Therefore, it was possible to diagnose that the students felt excited and more independent while carrying out the proposal and equally enjoyed not having been assessed using a

‘traditional test’.

The students understood that learning was qualitative and was consolidated through research and information collected, and, after discussions, new knowledge was substantiated and/or added to pre-existing knowledge. The teachers noted the positive results, reinforcing the awareness of the role that each teacher must play as a mediator in the formative teaching-learning process.

CONCLUSIONS

The didactic proposition presented, from the beginning, was contiguous to an integral and open perspective of teaching, intrinsic to the culture and formation of language, its symbolic processes and its decipherings carried out through dialogical links between peers in the school environment, a vision found in Jerome Bruner, David Ausubel and Lev Vygotsky, especially.

The photographs were “potentially significant materials”, as recommended by Ausubel (2000), which motivated students and helped them in the teaching-learning process, inducing them to seek answers to their questions. They also considered each photograph as an enigma - referring to each meteorological/climatological phenomenon - that had to be solved. And they were able to “see” inside the space-time of each photograph, making conjectures collectively, with the assistance and supervision of the teachers.

And, finally, they inferred the “footprints” present in each photograph, in a cognitive-investigative-dialectic chain, transposing a real meaning to their learning and being able to trace other narratives, in search of a fully geographical and eloquent, more applicable reasoning. and close to your reality and experience. Thus, as advocated by Jerome Bruner, student learning occurred through discoveries and questions, where they had

an active attitude in composing their own assessments, further strengthening the need for a new way of thinking about education and learning.

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