MULTIMEDIA CARTOGRAPHY AS LANGUAGE IN LANGUAGE IN THE GEOGRAPHY TEACHING[1]

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ABSTRACT

Introduction: The development of cartographic techniques has favored cost reduction and the distribution of cartographic representations in electronic ways. The availability of these representations, mainly in research sites in the web, and in different presentation scales, is becoming very common, contributing to the significant increase of the number of people that seek for the help of digital maps. This way, both in digital and virtual environment, the reader is not only limited to the act of visualizing the map as it happens in printed materials. He has the possibility to interact with the map and, in some cases, modify it according to his interest as a co-author. These new representation and communication forms of space information are called Multimedia Cartography. However, we have only a few works that specifically emphasize the use of those new languages in school and in Geography teaching. In this sense, this research has the School Cartography as theme, particularly the one related to the understanding of the concept of Multimedia Cartography as a new language that can allow the production of significant knowledge concerning the geographical space. Our concerns, however, extrapolate the search for a simple discussion of the principles, laws and generalizations of Multimedia Cartography. They are extended to the study of cartographic representations supported by multimedia and their use in Geography teaching. **Objectives**: This way, this research has the objective to discuss Multimedia Cartography principles, and analyze its potentialities and limits in relation to knowledge production in Geography teaching. Specifically, we want to: a) understand Multimedia Cartography conceptual foundations; b) discuss some modalities and interactivity degrees that language can provide; c) and analyze Multimedia Cartography projects available both in Internet or in *digital means*. **Methodology**: Our discussion has as central axes the theoretical referential related to School Cartography, Multimedia Cartography, new information technologies and Geography teaching as well. That favors us to structure our research in two parts. The first searches to introduce some concepts that are basic for understanding Multimedia Cartography as media, multimedia, interactivity, hypertext, hypermedia, among others according to the literature. We also introduce the concept of Multimedia Cartography, and others that are inherent to the subject such as:

[1] Research conducted in the Group 'School Geography and Cartography' coordinated by Prof Dra. Rosângela Doin de Almeida, with the objective to develop research that can relate theory and concepts of Geography and Education that are on their turn related to Cartography language. Sponsored by: CNPq

cartographic visualization, electronic atlas, hyper-map, interactive map, all of them aligned to their structuring and distribution ways. Interactivity is constituted as a conductive line of this research, as we consider that knowledge is constructed in a collaborative way, based on the student participation, and not under the form of passive reception of information on a theme or concept. In that way, we attempt to define some categories to be used for classification of interactivity allowed by some projects of Multimedia Cartography available in (non)institutional websites that will be analyzed on the second part of this study. Our presupposition is that Multimedia Cartography is presented as a new language which is different in the way the user creates and manipulates cartographic representations supported by *digital means*. That can reveal new relations with the construction of knowledge on geographical space, as we consider that the *digital mean* can change the relation between people and maps and between people and the world as well, considering that the mediation language is another one and, consequently, learning cannot be the same.

Results: Our presupposition is that Multimedia Cartography is presented as a new language which is different in the way the user creates and manipulates cartographic representations supported by *digital means*. That can reveal new relations with the construction of knowledge on geographical space, as we consider that the *digital mean* can change the relation between people and maps and between people and the world as well, considering that the mediation language is another one and, consequently, learning cannot be the same.

Conclusions: We don’t intend to defend technological determinisms, but the idea that different languages can favor the construction of knowledge that is necessary to understand socio-spatial organization. We understand that the study of Multimedia Cartography can evidence aspects such as the idea that linearity and hierarchy in printed maps occur under multiple connections and interpretations when produced in flowing nets (less fixed) of space representations.

Keyword: Multimedia Cartography. New Information Technology And Communication. Teaching of Geography.

The technician-scientific development has facilitated the emergence of new instruments for mapping several geographical phenomena of the earth surface. That has favored a revolution in cartographic science and in the social interaction with several cartographic forms as well. Currently, the use of the computer science allied to techniques of Remote Sensing, and Geographical Information Systems (GISs) have provided qualitative changes in attainment, storage, publishing, access, and interaction to the several cartographic representations such as maps, satellites images, aerial pictures, among others (PETERSON, 1999).

Thus, the development of cartographic techniques has favored cost reduction and the distribution of cartographic representations in electronic ways. The availability of these representations, mainly in research sites in the web, and in different presentation scales, is becoming very common, contributing to the significant increase of the number of people that seek for the help of digital maps (CARTWRIGHT; PETERSON, 1999).
Cartographic products - analogical or digital - that before were restricted to a “technical elite”, can currently be used both by school subjects and by people in general. We have seen information linked to cartographic forms presented in outdoors, tourist guides, building locating maps, urban lots pamphlets, engineering works, and advertising in general. Computer technologies have provided the combination of maps with other media, such as texts, graphs, sounds, videos, and animations, making them more *dynamic* and *interactive*.

This way, both in digital and virtual environment, the reader is not only limited to the act of visualizing the map as it happens in printed materials. He has the possibility to interact with the map and, in some cases, modify it according to his interest as a co-author.

These new representation and communication forms of space information are called Multimedia Cartography. In countries such as Australia, England and Canada several researchers have dedicated to the study of Cartography using multimedia and Cartography resources for the web, looking for its use in school education. However, we have only a few works that specifically emphasize the use of those new languages in school and in Geography teaching.

It was verified that the theme “Multimedia Cartography” was not directly contemplated neither in the Annals of the VI Colloquium of Cartography for Children and School Students, nor in the II Forum Latinoamericano of Cartography for scholars. Nonetheless, the theme “School Cartography in Planning Institutes”, presented two experiences related to the development of projects based on geo-processing and applications for the Internet.

Among the 63 works of the event, only six were related to “Multimedia Cartography”. Among them, one was about the use of Google Earth as a support tool to the teaching of Cartography; one would approach Google Maps's use for the construction of location knowledge and orientation for children of the Elementary Level; one would discuss about the use of Remote Sensing applied to school Geography in the Elementary level; another work would propose the creation of a website in order to facilitate the understanding of cartographic contents.

The other two works have been developed by researchers of the research group in Geography and School Cartography of the São Paulo State University at Rio Claro. One is

related to online mapping programs, understood as “a new cartography”, however not specifically concerned to school teaching. The other work is related to this research.

Our interest in researching that theme is due to the fact that many cartographic projects in multimedia are limited to introduce cartographic forms transposed from paper to the digital way, keeping the same static and sequential character of the printed page.

What has been denominated interactivity in maps is many times limited to some pre-established movements arranged by the organizer of the multimedia project, restricting users to a lineal movement in the content. The inter-agent is not allowed the possibility to make his own choices, combinations nor increments of any content to a cartographic project, and the interactivity is restricted to the movements that were previously programmed. Some projects of Multimedia Cartography just pile several medias, under-using the specificity of those resources in a way to potentiate the production of knowledge about the space.

In this sense, this research has the School Cartography as theme, particularly the one related to the understanding of the concept of Multimedia Cartography as a new language that can allow the production of significant knowledge concerning the geographical space.

Our concerns, however, extrapolate the search for a simple discussion of the principles, laws and generalizations of Multimedia Cartography. They are extended to the study of cartographic representations supported by multimedia and their use in Geography teaching. Curricula guidelines for the elementary level, as the Curriculum National Parameters, emphasize the importance to consider the different languages of information and communication, with the objective to provide ways of learning, interpretation, synthesis and explanation of the world. That makes us to question: in what aspects cartographic representations supported by multimedia can modify the production of knowledge about the world? What other space and world readings are possible to be done from that new language of space representation? What are the contributions, limits and perspectives for the use of Multimedia Cartography in Geography teaching?

Although multimedia has been valued as a mere technology for teaching/learning (FREUNDSCHUH; HELLEVIKS, 1999), the research published is not enough neither for the integration of those resources in Geography teaching, nor for the evaluation of the effectiveness of those new languages in the construction of knowledge by the student. However, the teaching models ruled in printed materials are not enough when dealing with the technological reality in which education is inserted in the beginning of this century (PETERSON, 1995).

This way, this research has the objective to discuss Multimedia Cartography principles, and analyze its potentialities and limits in relation to knowledge production in Geography teaching. Specifically, we want to: a) understand Multimedia Cartography conceptual foundations; b) discuss some modalities and interactivity degrees that language can provide; c) and analyze Multimedia Cartography projects available both in Internet or in *digital means*.

Our presupposition is that Multimedia Cartography is presented as a new language which is different in the way the user creates and manipulates cartographic representations supported by *digital means*. That can reveal new relations with the construction of knowledge on geographical space, as we consider that the *digital mean* can change the relation between people and maps and between people and the world as well, considering that the mediation language is another one and, consequently, learning cannot be the same.

In that way, our discussion has as central axes the theoretical referential related to School Cartography, Multimedia Cartography, new information technologies and Geography teaching as well. That favors us to structure our research in two parts. The first searches to introduce some concepts that are basic for understanding Multimedia Cartography as media, multimedia, interactivity, hypertext, hypermedia, among others according to the literature.

Despite those concepts be presented as study objects by different knowledge areas, we consider this focus necessary in the perspective of the representation of the geographical space, because of its implications in the teaching of maps mediated by computer.

We also introduce the concept of Multimedia Cartography, and others that are inherent to the subject such as: cartographic visualization, electronic atlas, hyper-map, interactive map, all of them aligned to their structuring and distribution ways.

Interactivity is constituted as a conductive line of this research, as we consider that knowledge is constructed in a collaborative way, based on the student participation, and not under the form of passive reception of information on a theme or concept. In that way, we attempt to define some categories to be used for classification of interactivity allowed by some projects of Multimedia Cartography available in (non)institutional websites that will be analyzed on the second part of this study.

According to Cartwright (1999) the development of the term "multimedia" started in the 1970s, and there is still no agreement on its meaning. The several industry sectors, as films, games and toys, computers, among others, have different understandings on what it constitutes multimedia. However, according to Peterson (1999, p. 127) "multimedia are the

several combinations of texts, graphs, animation, sound, and video for the purposes of improving communication", that is, it is the integration of several communication ways to transmit information.

This way, the use of the term multimedia was incorporated to the Cartography in the 1980s, being presented as support to the combination of maps with other medias (texts, illustrations, videos, sounds), seeking to represent the world in a more realistic way (Peterson, 1999, p. 34). That author argues that the several medias can “create different expression forms”. So, "a 'multimedia map' can be built in several layers, each one driven to the different users' needs”.

In that sense, the use of the computer made possible to the user to change his relationship with the map, as that resource allows the selection and presentation of information of what one wants to know. Therefore, the computer has added a component known as interactivity, through which the user can actively participate of the selection and presentation of information, simply leaving a passive observer's condition, to be somebody that selects and interferes in the presentation of information. That resource is known as interactive multimedia (PETERSON, 1999).

We don’t intend to defend technological determinisms, but the idea that different languages can favor the construction of knowledge that is necessary to understand socio-spatial organization. We understand that the study of Multimedia Cartography can evidence aspects such as the idea that linearity and hierarchy in printed maps occur under multiple connections and interpretations when produced in flowing nets (less fixed) of space representations.

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