

THE USE OF DIGITAL IMAGE MAPPING AND RESOURCE TRAINING AS SECONDARY. SOME DETAILS ABOUT A GOOGLE EARTH

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I. INTRODUCTION

Nowadays, geography undergoes a process of educational and methodological renewal that is changing the ways in which teachers must approach their work in the classroom. Geography is one of the disciplines currently undergoing major changes to adapt to the new knowledge society and these changes are reflected both in the way students learn the geographical space as, in the current scientific and didactic approaches that are needed.

One aspect that must be considered in the process of methodological change that the teaching of this science in secondary education is experiencing is the increasingly frequent use of new information and communication technologies in its teaching.

In recent years, the new technologies applied to the domain of cartography have led to major improvements in the quantity of information and especially, in the easy access to that information. The widespread dissemination of spatial images in the media has helped people become familiar, since early, with spaces or remote locations that previously could only be represented by maps of difficult access, complex to read and understand. On the other hand, in the treatment of problems affecting the planet, particularly in the environment, one can see a certain unity or consensus. That demands the acceptance of studying, analyzing and quantifying these problems from the space as the most accurate and economic way. Hence the importance of working in the classroom with all those resources, that alone us the knowledge of geographical facts from a global perspective such as satellite images, the techniques of digital mapping and photo interpretation.

We must not forget either the instruction and development in the classroom of the traditional mapping techniques and skills, which currently run the risk of marginalization. They have a special importance as they constitute the alphabet and basic signs used in the new cartographic language. From this perspective, the elaboration of the domain of mapping techniques, traditional or innovative, is as necessary as any other code of communication.

We must have a minimum never of «cartographic literacy», it is important for teachers of Geography and other related areas, meet and explore new tools to develop skills in their classes to manage geographic information, essential in the XXI century.

II. THE IMPORTANCE OF WORKING WITH MAPS

Spatial cognition is one of the basic coordinates of reference for social sciences, along with time. The successful construction of meaningful learning by our students largely depends on how they are able to place correctly on both coordinates. Thus, we can find many geographical «problems», directly related to, the reading, the analysis and the interpretation of spatial representations (maps, plans, drawings, satellite images, etc.). Therefore, the map contents are inherent to the learning of social sciences and particularly to geography, where they acquire a structural and central function, in the words of Yves Lacoste: the maps are «the geographic language par excellence.»

III. THE TEACHING OF GEOGRAPHY AND THE NEW TECHNOLOGIES

The development of media and the phenomenon of globalization, which have occurred during the last twenty years, require that access to information and, its exchange must be larger. The changes are of such a size, scope and depth that have begun to alter individual behaviors and social relations in the field of economics, politics, science, education, culture and leisure.

Those who most enthusiastically welcome these developments are the youngest, our students. With little effort they, become familiar with the use of telecommunications and computing, even only as a recreational vehicle. Teachers have to be aware that very soon, students will not have known a world without computers, they will grow in the digital age. These facts support the need to integrate new technologies in formal education. Secondary, generally welcomed the changes in their environment with some prevention and it does not always react quickly enough.

ICT advances have made possible in large part to meet these needs posed by the teaching of Geography. Internet, Geographic Information Systems and aerial and satellite photographs have made this progress. An example of this is a new application: Google Earth.

1. Internet in the classroom: a powerful educational resource

The main contributions made by ICTs to the current teaching of geography can be specified in the use of Internet as a source of mapping information and the use of software to map and organize information. The getting answers is, easy and fast, while it is also allowed a better understanding of the phenomena that occur in the area or that have a bearing on this.

Geography has to play a role in the formation of the student regarding space. This «spatial awareness» emerges from the perception of our environment and from prior knowledge of students. Internet can serve to motivate students, to facilitate understanding of concepts, to build skills and analyze representations of other spaces. But this use must be integrated into the procedures within the planning and it can not function as a disconnected or isolated

activity. Ultimately using internet in Geography is to create a marriage between teaching and information «and to apply the principles of the geographic method, taking into account that visual images are the shortest way to understand and characterize the geographical facts.

2. The usage of GIS

Geographic Information Systems (GIS by the acronym: Geographic Information Systems) are one of the most important methodological tools we have nowadays to explore the world and understand many territorial dynamics. Beyond knowing where a particular item is located in the territory, it involves the use of specific software to treat or manipulate those geographical information. Examples of using GIS are unlimited, as unlimited is the type and the amount of information that can be associated with particular places on earth.

GIS are already far from belonging to the unique level of high technology and specialized professional practice. But while the availability of geographic information is becoming more widespread and accessible, it is essential to have knowledge of how to handle this information, understanding how it is structured, how it provides and how we can extract maximum benefit.

GIS, in short, allow students to dip in to real situations and place them as critical agents in front of this reality. They are posed real problems to look for solutions. This teaching is based on the resolution of problems. GIS in the educational context conduct to a learning situation that allows to analyze spatial relationships and interactions to reach their own conclusions.

3. Problems related to the use of computers

The benefits considered can not lead to mystify new technologies or to expect drastic changes in the processes of teaching and learning. It is not a panacea, only a resource, an extremely attractive and powerful resource. The negative aspects are diverse: some have the teachers as a reference point, others students and there are some with a methodological. Understanding valuing and trying to overcome their negative aspects, is a prerequisite to exploit this resource.

IV. THE NEW CURRICULUM FRAMEWORK

Today we witness a series of profound changes occurring within the Spanish society and these are reflected in the great amount of legislative changes that are formulated by the different educational authorities. The LOE has been a major change in the secondary curriculum. The specific objectives at this stage consider the development of skills related to the use of language mapping and digital imaging. It is reflected in the curriculum, that mapping expression allows the thematic geographic analysis of different spatial scales and how using two properties inherent to mapping, such as options on the scale and the use of different thematic variables, one can achieve the development of skills that are intended at this time. On the other hand, the acquisitions of «Key competences» are considered taking into account the inclusiveness in the domain of Social Sciences, Geography and History. Among the key competences related to linguistic communication, mathematics or the social

or artistic dimension, we can highlight some related to the skills where the spatial component and representation play an essential role

V. GEOGRAPHICAL INFORMATION ON INTERNET

Any attempt to systematize and gather geographical information that exists in the network seems to be doomed to failure or, at least, to have a precarious present. The configuration of the World Wide Web, the vast geo that emerges new or updated daily, makes that a project with such characteristics pose a challenge worthy of consideration by the geographic community.

Spatial Data Infrastructures (SDI) are a new model in the treatment and use of geo-information (GI). In Spain we have the IDEE (Spatial Data Infrastructure of Spain) which aims at integrating through Internet the data, metadata, and geographic information produced at national, regional and local levels, providing all potential users with location, identification, selection and access to such resources.

We also have another set of servers providing satellite images. Let's highlight those offered by CREPAD, Digital Globe, ESDI, GeoCover LANDSAT 7, LANDSAT, SPOT sensor, the Shuttle Radar Topography Mission Endeavour space shuttle, the USGS, the SIGPAC or WMS Global Mosaic.

Conventional mapping and associated databases can also be consulted in digital format on most of the world map institutions. In Spain we emphasize that offered by the National Geographic Institute in CNIG portal (National Geographic Information Center of Spain).

VI. DESCRIPTION OF USE: GOOGLE EARTH

Since Google Earth appeared in the summer of 2005, with its first beta version, up to now the acceptance and development that this product has achieved has been widespread. This phenomenon has meant that the geographic information can come easily and directly to a large number of people not familiar with the handling of geographic data and in particular with data from satellite images and orthophotos.

Google Earth is a program installed, that once in your computer, allows us to surf virtually anywhere in the world. It includes photos taken from satellites at all corners of the globe. It has information about all countries and cities, roads or administrative boundaries. Google has capabilities in terms of thematic mapping, virtual tours, and search for specific locations.

1. Description of the tool

Google Earth is an application that is installed locally on a personal computer. The rapid answer of information, which is what determines the potential of the application. Images can be displayed on a 3D surface, digital elevation model. On this «map» basis spatial information of different types can be added.

The basic data of Google Earth is composed mainly of satellite images and aerial photographs, both updated regularly.

2. Google and the importance of cartographic language

Since the ICT revolution, drastic changes have been triggered in the mapping and visual communication, due on one hand to the power and flexibility given to the design and mapping, and secondly to the liberty, low cost and flexibility to spread any kind of spatial representation.

Traditional concepts of location, orientation, scale, place names and associated thematic information volumes continue being central in the production of maps, even after the arrival of tools like Google. One wonders whether with online mapping tools, one should be made harder efforts on the fact that they can provide complete and accurate information though sometimes at the expense of good cartographic principles in the design of maps.

Let's see how far Google Earth meets the basic elements underlying the cartographic documents.

- The location of a point is determined the same as in conventional maps.
- Google Earth allows to easily changing orientation with regards to the magnetic north.
- The issue of scale has been resolved exception ally as the program increases or decreases the level of resolution of the information displayed, making it possible to switch among different mapping scales.
- Google Earth admits various types of vision of the landscape, its chances of exceeding the orthogonal view with which conventional mapping is performed.

3. Some limitations

One of the first limitations is that it does n't count nith a global coverage of high resolution orthoimagery and homogeneous characteristics. Another disadvantage is the degree and the criteria for updating the images. The time dimension seems to be one of the thorniest issues. With Google Earth you can only perform synchronous evaluation of the moment when making the satellite image. Google Earth does not allow a diachronic perspective. It is also true that the limitations we have seen will be rectified as different versions are updated. The application itself adds more features, more and more land with better image resolution, the position is being corrected, and the images are being renovated by more updated pictures and more layers of information are added.

VII. TEACHING STRATEGIES. USING GOOGLE EARTH IN THE CLASSROOM

Two types of activities geointeractive are valued: Earthquest and Geoquest. We also consider some educational and scientific proposals that haven use of Google Earth as the primary source of information: Around the World in 80 days, those in the portal Eduteka, Urbanita 2000, Atlas of poverty, etc.

The consideration of all these proposals from our experience as educators tells us that we are seeing major changes on these technologies, unavoidable changes that force us to change the ways we can study territorial complexity with studens.

VIII. CONCLUSIONS

The application analyzed and similar ones show that not everything is invented and the web can be an appropriate mechanism for complex applications from a technological standpoint. From a geographic point of view interesting for us we witness the creation of what might be called a society to geography sensitive, thanks to Google Earth. The aspects related to the location and spatial extent of human events are gaining a new dimension today to which new lessons are part off. Their inclusion into the curriculum proposed by educational Reform and into the Royal Decree that sets out the minimum contents of compulsory secondary education, as well as the fact that they occupied a privileged place in the expression of keys competences or initial blocks of each course, show the great importance of this learning that, is acquired in the from the approach of geographic science. Regardless of cartographic production engines, the maps should continue being loyal their traditional definition. In the age of Google it seems that this idea keeps on, definitely raising the need to adapt and differentiate map products, from georepresentations, combining them with the interests of the end-users and the specific role of the map.