

## **“LEARNING GEOGRAPHY IN THE XXI CENTURY” WEB GIS COURSE FOR TEACHERS**

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### **ABSTRACT**

Geography teachers in Bogotá and in general in the country are not trained in the use of geo-technologies, and for reasons of working hours, they cannot dedicate time to take courses that demand full time. For this cause a GIS web course was created in order to introduce the teachers with GIS tools through the Internet. The course was developed in ArcGIS Online and also used many tools such as guides, reports and test. The most important result of this project is the participation of different organizations such as the university, schools and to achieving the interest of the Ministry of Education of Colombia.

The challenge of the project is to minimize the education of geography and History in analog way. Therefore the main objective of this project is to introduce the teachers of secondary schools to GIS concepts and applications using virtual education. The result expected is the teachers are capable of to transfer their knowledge to the students using GIS tools. The web GIS course was aimed only for teachers of social sciences of secondary schools in the city of Bogota, but was offered for those of the whole country across the portal “*Colombia Aprende*”, using resources and tools of ArcGis online platform.

**KEYWORDS:** GIS, virtual course, secondary schools, geography

## **INTRODUCTION**

In Colombia the teaching of geography and history at the secondary schools is still doing using conventional tools, so the use of GIS in the classroom is not yet implement. The main reason of this situation is the lack of education for teachers of social sciences at secondary schools in geo-technologies. For these reason the Distrital University has been working on the development tools and courses to teachers in order to introduce them in the field of GIS. Framed on these, the project entitled “Learning geography in the XXI century” web GIS course for teachers” was created and developed by students of Cadastral and Geodesy program and directed by the research group NIDE . The project was focused on the social sciences teachers of the secondary schools in Bogota, considering that those teachers cannot attend a fulltime course, therefore the main objective was to create a GIS virtual course using ArcGis online and moodle.

## **OBJECTIVE**

The aim of the project was to incorporate the concepts and tools that provide GIS in the teaching - learning integrated social sciences (geography and history), at the junior and high secondary education through the implementation of teaching methodology developed in a GIS virtual course, aimed to social sciences teachers of public schools in the city of Bogota, Colombia. Also implement and promote the use of resources and technological tools in learning social science especially geography, ruled by the education standards given by the Ministry of Education of the country, for sixth to tenth courses at the secondary school.

## **METHODOLOGY**

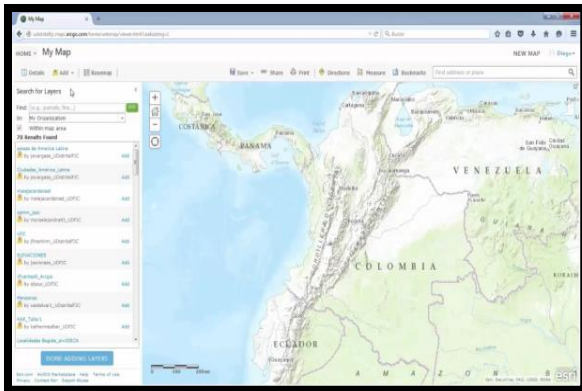
The proposed methodology was supported by the following phases:

- **Pre-diagnostic:** In this phase the aim was to gather information regarding the number of public schools in the city of Bogota and to define the sample in order to make interviews with teachers of social sciences in these selected schools. In this phase the survey for social sciences teachers regarding their knowledge about GIS

was generated.

- **Diagnostic:** Here was defined the public schools to be visited and implemented the survey to teachers of five schools in the locations of Engativa (3 schools), Barrios Unidos (1 school) and Ciudad Bolívar (1 school) in Bogota.
- **Course design:** This phase was aimed to design the course for social science teachers. Therefore we defining the syllabus of the course, considering that this course is focused specifically for teachers of geography and history, consequently has characteristics that differentiate it from other GIS course and because it was a virtual course. The program content was made based on the results of the survey which showed the lack of knowledge of teachers in the field of GIS. The challenge was to ensure that teachers can use this course in the classroom to teach Geography. The course was dividing in four units, one per week for a total of 16 hours.

**Figure 1:** GIS virtual course in ArGis on line platform



On the other hand the workshops for each theme of the course were generated. Each of these workshops was designed sufficiently clear and simple in order that teachers would not have problems to solve it. Also in order to give more tools for

understanding the concepts of GIS nine (9) videos were created, guides, reports and the tests for each unit.

Figure 2: Virtual GIS course content

In this phase as well, the GIS application using ARCGIS online was created for the implementation of the course. For the virtual part, the Ministry of Education supplied for the project, the platform or portal called “Colombia Aprende” in order to place the virtual course, there using moddle.



### - Implementation

During this phase the GIS virtual course was implemented at the moddle platform at the Ministry of education portal “Colombia Aprende”. The procedure was the following:

- a) invite the social science teachers who were surveyed at the schools, to participate to the GIS course
- b) invite through the portal “Colombia Aprende” all teachers of social sciences wishing to participate in the course, no matter where they were located in the country, which means there was not restriction for those that not belonged of schools of Bogota
- c) opening the registration to the GIS course through the portal “Colombia Aprende”
- d) Course development, which was opened for a month

### - GIS course validation

Once the course was finished, the evaluation of it was made by surveys of perception and acceptance of the proposed methodology to teachers and also with workshops to students led by the teachers participants of the five schools visited in the diagnostic phase.

Figure 3: Workshops for students in public schools of Bogotá



## RESULTS

In general the main results of the project are the following:

a) Methodology of teaching – learning for social sciences (geography and history) using GIS, including the generation of educational material such as: syllabus, thematic contents, videos, guides, test, and workshops among others.

Figure 4: Material created for the virtual GIS course



- b) GIS Web Application focused on contents in geography and history using ArcGIS on line
- c) Virtual GIS course focused on teachers of Social Sciences in moodle at the portal “Colombia aprende” of the Ministry of Education
- d) Workshops for high school students of five public schools of Bogota
- e) Surveys to social sciences teachers regarding their GIS knowledge and perception of the proposed methodology for teaching learning with GIS

f) Statistical analysis of the virtual GIS course in Bogota, as following:

- A total of 124 teachers from across the country were enrolled
- The 26% of the teachers finalized the course, that means 21 teachers of the total
- According to surveys 95% of teachers considered the proposed methodology for teaching geography and history using GIS could be applicable in the classroom

## **CONCLUSIONS**

The main conclusions of the project can be summarizing on:

The use of geo-technology especially GIS is an important tool for the teaching -learning process at the secondary schools and teachers have to learn how to use this tools.

Academic institutions such as the Distrital University in Bogota, have an important role in the knowledge transfer to students and teachers in the field of GIS and the students of the cadastral and geodesy program have the knowledge to promote and encourage the use of GIS in education in secondary schools.

It was really important to have the support of the Ministry of Education of Colombia because it allowed to dissemination massively the GIS course for the whole country and not only for the city of Bogota.

Social sciences teachers have a good disposition to learn new technologies for the teaching-learning process, but still is not representative the number of teachers that are involved in the GIS issue.

Creating and implement virtual GIS courses are important for social sciences teachers, because they can manage their own time to do it, without leaving the classroom.

It is important to continue working in this project, in order to increase the number of participants that finishing the course and improve the educational material.

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