

GEOGRAPHICAL INFORMATION SYSTEMS' PLACE AND IMPORTANCE IN SOCIAL STUDIES LESSONS

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ABSTRACT

In the general objectives of the social studies curriculum, in the seventh item “information is used , organized and improved in appropriate formats and various forms(by map, graphic, table, sphere, diagram, time band etc.)” and in the eleventh item “information and communication technologies are used and the process of development of science and technology and its effects on social life are understood” are included. Based on these statements, technologies and modern applications should be used in social studies lessons. Teacher provides the information. Teacher candidates and teachers have to know the new applications to facilitate the understanding of the lesson. They have to follow constantly renewed technology and should use it on their area of expertise. In this study, geographical information systems will be introduced and some of the topics of units' visual applications in primary education at the sixth and seventh grades will be explained by means of ArcGIS 9.2 software program. Thus, the importance of geographical information systems about the geography applications in social studies lessons will be emphasized.

Key Words: Geographical information systems, social studies, technology usage, to do visual, ArcGIS 9.2

INTRODUCTION

Today, the technology must be used to benefit from knowledge effectively. Informations (data) should be stored in a system and used for the aim. Especially it is important that related to the forming map applications. Geographical information systems a technological vehicle to apply these targets. In Turkey, in the objectives of social studies curriculum it is mentioned that the information is used visually(map, graphic, table, sphere, diagram, time band etc.) and is developed(the seventh item), in the other one to utilize from the information and communication technologies(the eleventh item)(Principle National Education Law, 2004, number:1739, Bilgili, 2010). In this situation, to be employed the information technology as GIS(Geographical Information Systems) in social science lessons in schools is necessary and important to reach its objectives of the curriculum. To do social studies particularly the geography topics should be done more visually by means of GIS. The applications which are done with geographical information technology(GIS) will obtain visuality during the lessons and the subjects will be taught to the students permanently. Geography is a scientific branch which examines the place. The map is rather important in geography science and the results of the geographical researches are explained on the maps. Geographical informations are located on the maps and these are interpreted. Geography investigates the relationships between different locations. Because of it, geographical information technology is one of the important and useful tools while the geographical subjects are examined and interpreted. The teacher who knows , applies the geographical information technology can run and record data that is prepared by him/her by means of GIS software programs for the lesson unit. In consequence the teacher can present knowledges to the students visually.

In this study geographical information system was introduced. The purpose of the study is to call attention to geographical information systems which is useful especially for the geography lessons' learnings and teachings in social studies lessons and to the applications which are prepared by means of GIS technology, so the

students can learn easily the geographical topics in social studies lessons. To render conscious to the social science teacher candidates and teachers about geographical information systems and to inform them of applications about GIS were aimed.

What is Geographical Information Systems?

There are a lot of definitions had been made about GIS. Some of them are in below:

“It is a geography applications that it covers the gathering information, storage and analyze about the natural environment and human, time properties and relationships and it has methodology and has computer setting(Turoğlu, 2000, p.228).

“GIS is an computer system that can collect, store in computer environment, modernize, control, analyze and do visualization of the earth knowledges for the special target”(Tecim, 2008, p.51).

“GIS is an vehicle that it stores and analyze the geographical informations in computer setting”(ESRI, 1987).

In general GIS is the preparation of a study which is about the earth properties in computer environment, in the other words a computer system that can transfer and analyze the geographical informations.

The geographical information systems is a general name that provides to collect, storage, update, process of the geographical information and it keeps hardware, software and personnel (Uyguçgil, 2011, p.134). Geographical information is a concept which specifies that the location of the object on the earth or what kind of things there are. For example, where am I?, who are our country's neighbours?(Uyguçgil, 2011, p.133). Yomraloğlu and Çelik (1994) mentioned that to obtain the information, a way in the other words a system is needed. According to them the system is a methods sheme to get results and there should be a system for gathering and processing the information. The system that is used for this purpose is called “information systems”.

The stages of Geographical Information Systems

- 1-Collection data
- 2-Retention data
- 3-Processing data
- 4-Presentation

Geographical information systems is formed as five master components(Uyguçgil, 2011):

- Human(user)
- Method(the procedures about reaching data, collection, storage, presentation)
- Hardware(computer systems, for example computer, scanner, digitizer)
- Software(GIS software packages)
- Data

Turoğlu (2000) implied that data structures are divided into two groups as spatial data (graphic data) and non spatial data (text data). Spatial data cover digital data for the view. All of the science branches and occupational groups that the subject of the study about place, human, time can benefit from geographical information systems (Turoğlu, 2000).

How does GIS Works?

Geographical information systems works by layer logic. Data about worked case are run into computer, analyzed by GIS software programs, the results are projected as map, graphic, table or aore shown as printout. According to geographical information systems' working logic, data are very important and according to the aim of the matter, data are processed into the system and are displayed in GIS.

GIS is a system technology that provides to transfer the information to the computer program and does it by means of software programs. Today some of the main software programs which are used are in below:

ERDAS

ARC/INFO
Arc/GIS
Arc/View
MapInfo
IDRISI
NETCAD...etc.

METHOD

In this study, some of the topics of units which are taught in primary education at the sixth and seventh grades will be done visual by using ArcGIS 9.2 program which is a GIS software program with some model applications.

Lesson Applications

In below there are some model applications about the sixth and seventh grades social studies lessons. This model applications are formed by ArcGIS 9.2 software. Layer maps obtained from ESRI Education Applications in Demirci(2008) 's book and the ArcGIS 9.2 CD is found in it.

This is a course application about the sixth grade social studies lesson.

Unit: Life on the Earth

Topic: Understanding the maps.

Map's scale changes for using aim. While the scale denominator is decreasing, in other words scale is increasing, the detail of the map increases.

To display it:

It is open in ArcMap "Countries Layer" in ESRI Applications in ArcGIS 9.2 CD (Figure 1). Then follow the steps.

Step 1:

Open → C/ESRI/Education_Applications_1(Figure 1).

Step 2:

It is open a world map in Education Application 1. You can see the scale on standart tool bar as 1/146.000.000(Figure 2).

Step 3:

The scale can be changed as 1/10.000.000(Figure 3).

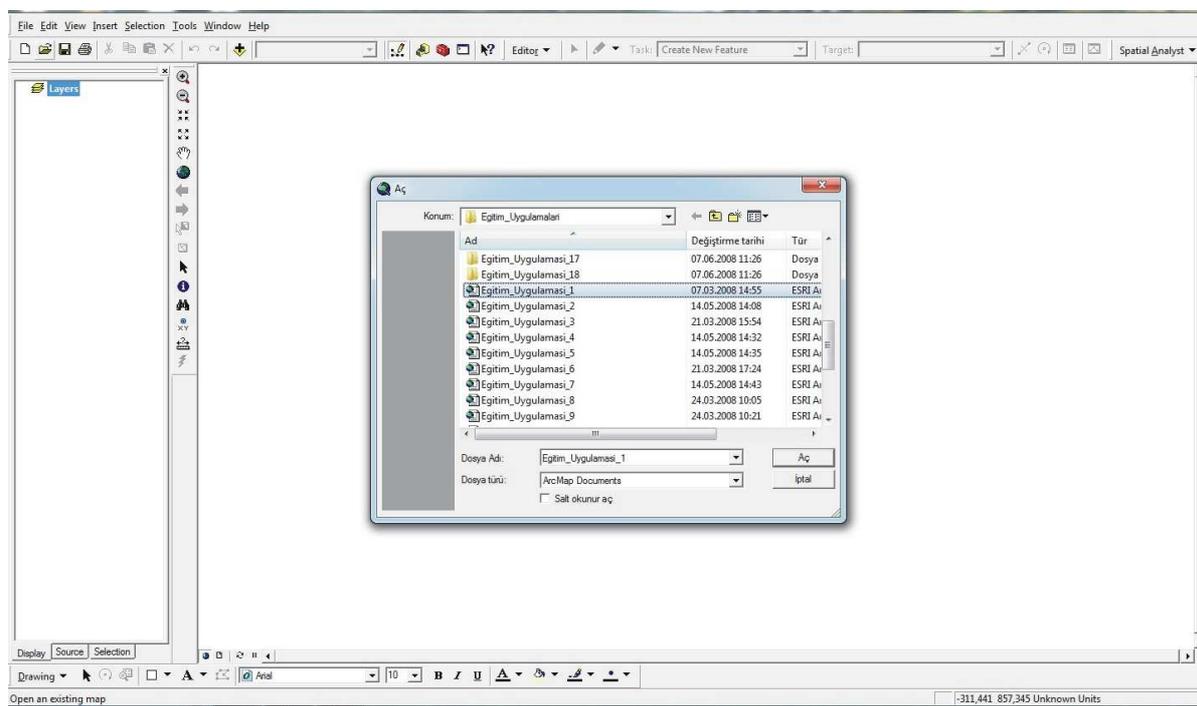


Figure 1: Step 1 is ArcMap application page about topic “understanding the maps” in the sixth grade social studies lesson(Esri licenced CD in Demirci, 2008).

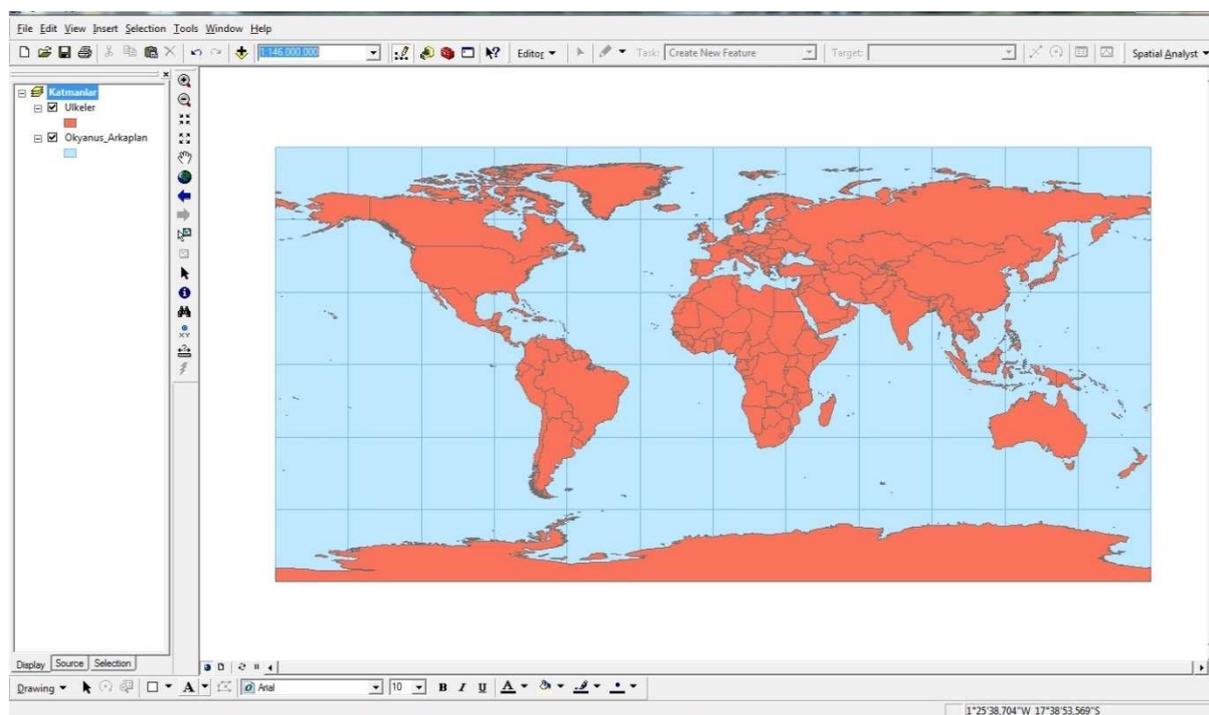


Figure 2: Step 2 is ArcMap application page about topic “understanding the maps” in the sixth grade social studies lesson(Esri licenced CD in Demirci, 2008).

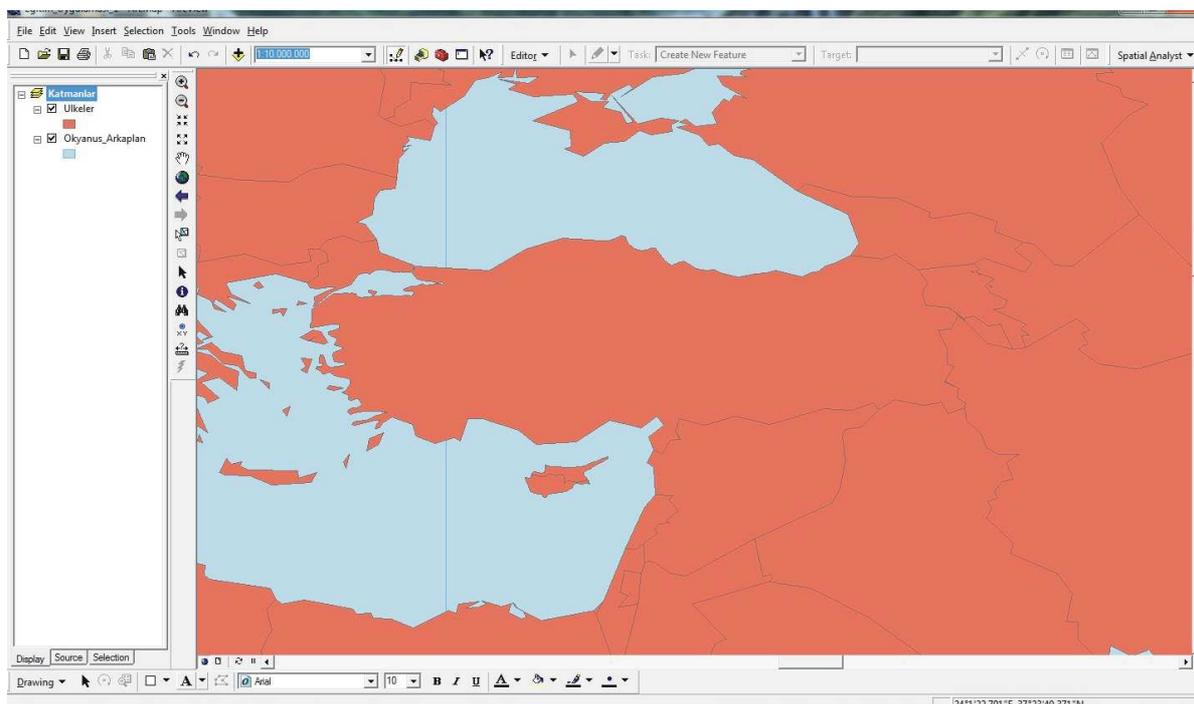


Figure 3: Step 3 is ArcMap application page about topic “understanding the maps” in the sixth grade social studies lesson(Esri licenced CD in Demirci, 2008).

The other course application about the sixth grade social studies lesson.

Unit: Life on the Earth

Topic: World of coordinates.

It is open in ArcMap “Countries Layer” in ESRI Applications in ArcGIS 9.2 CD (Figure 4). Then follow the steps.

Step 4:

Open → C/ESRI/Education_Applications_3(Figure 4).

Step 5:

It is open a World map in Education Application 3. You can see the World map(Figure 5).

Step 6:

On tool bar “go to xy” icon is found. When you click with mouse, a “ go to xy”window is opened. Then you can write the longitude and latitude values and click to enter. On the map, the point is showed(Figure 6).

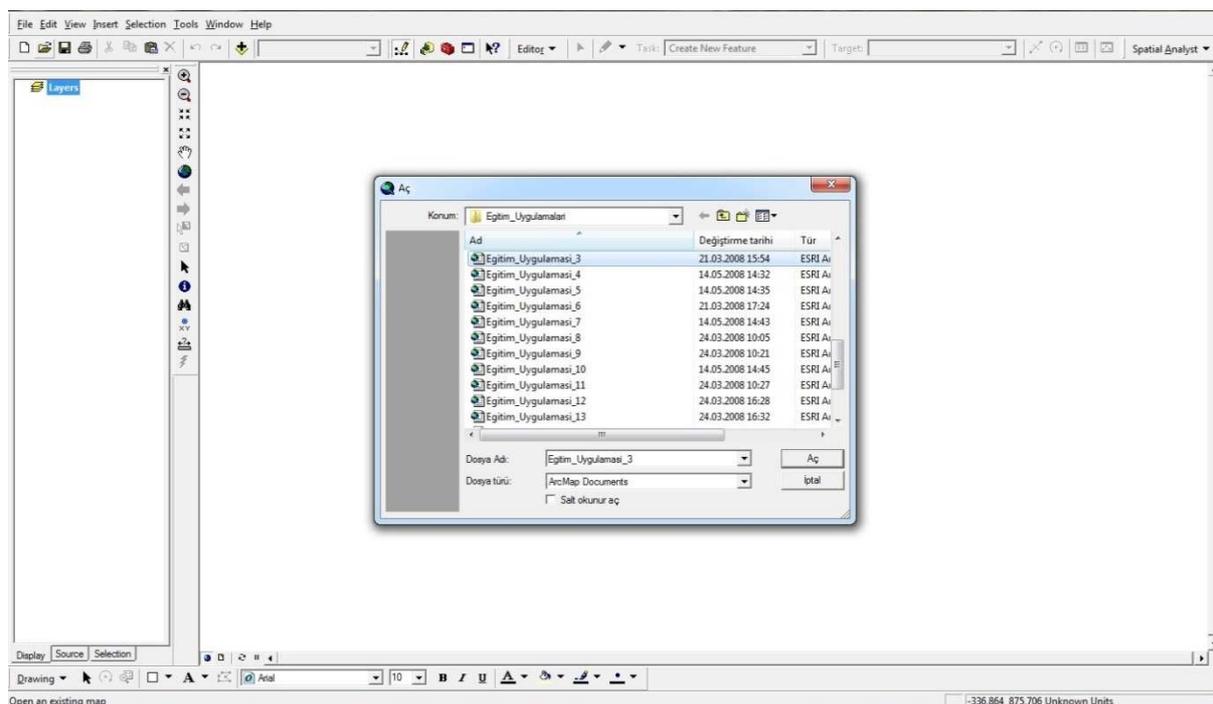


Figure 4: Step 4 is ArcMap application page about topic “World of coordinates” in the sixth grade social studies lesson (Esri licenced CD in Demirci, 2008).

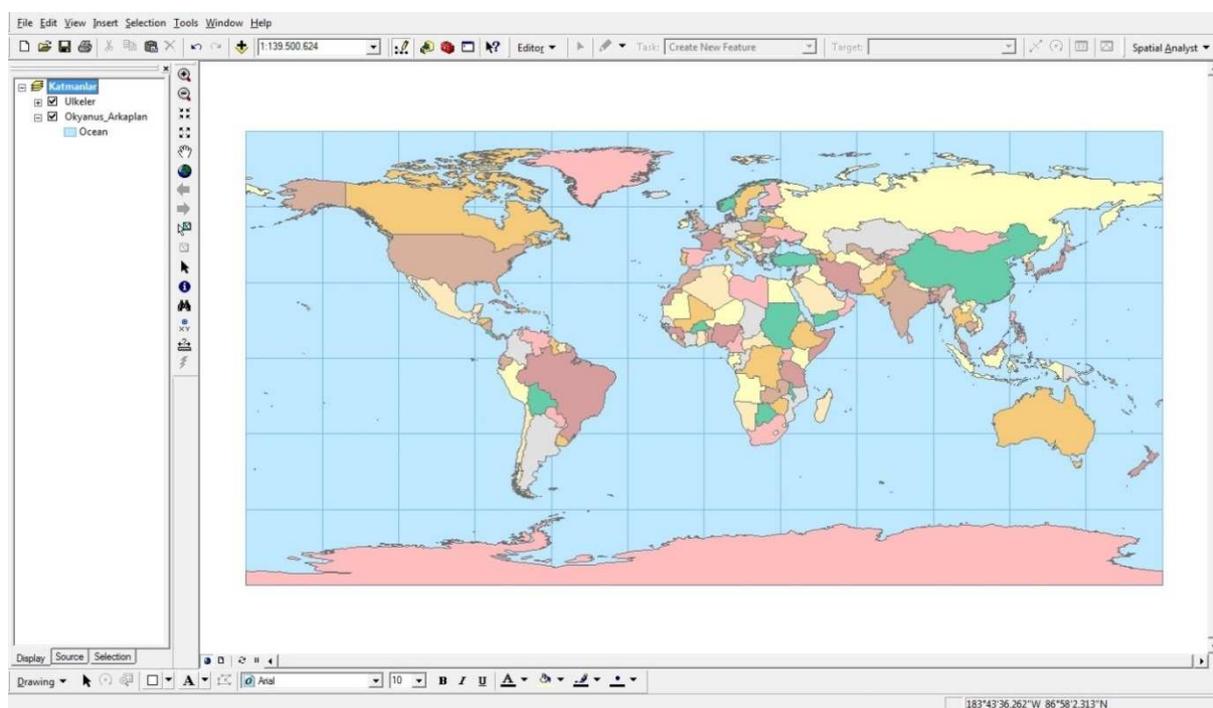


Figure 5: Step 5 is ArcMap application page about topic “World of coordinates” in the sixth grade social studies lesson (Esri licenced CD in Demirci, 2008).

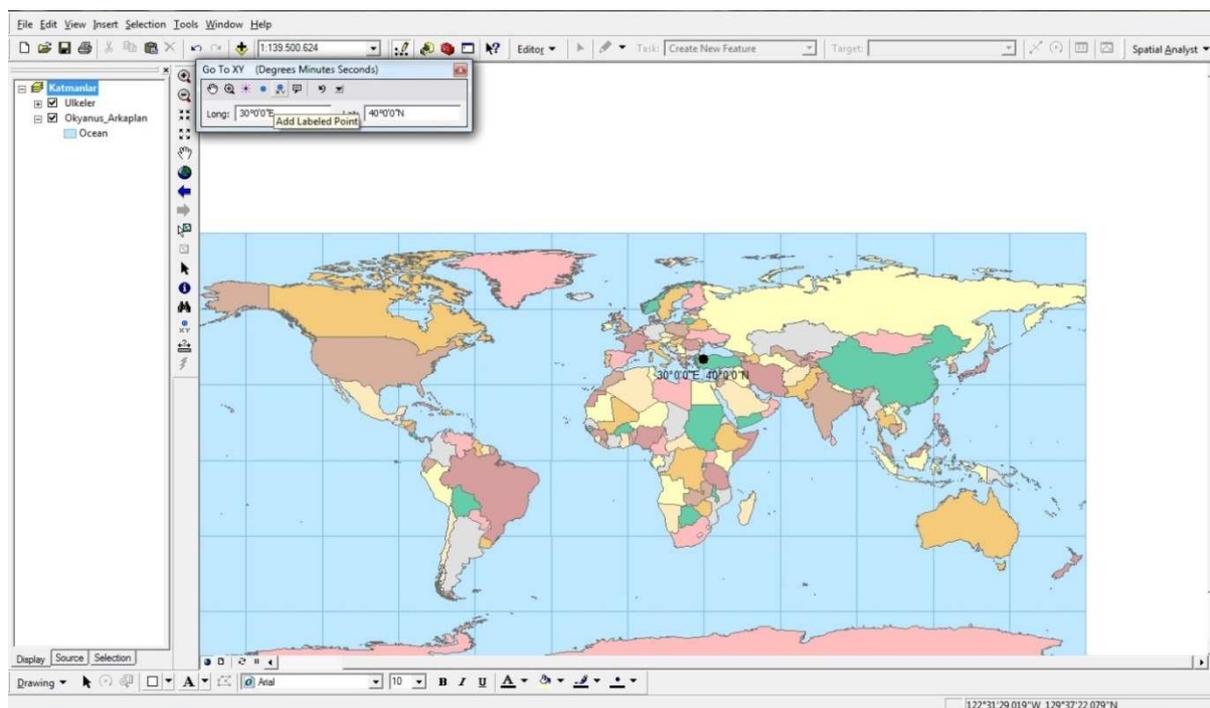


Figure 6: Step 6 is ArcMap application page about topic “World of coordinates” in the sixth grade social studies lesson (Esri licenced CD in Demirci, 2008).

Another course application about the seventh grade social studies lesson.

Unit: Population in our country

Topic: Life in places.

It is open in ArcMap “Türkiye Layer” in ESRI Applications in ArcGIS 9.2 CD (Figure 7). Then follow the steps.

Step 7:

Open → C/ESRI/Education_Applications_2.

Step 8:

To add some picture files, press by mouse the i(identify) icon on tool bar and go to the place of city on the map. The window is open that its name “i(identify)”(Figure 7).

Step 9:

Go to the city’s name and click by mouse as right touch, then click to add Hiperlink icon(Figure 8).

Step 10:

When the window open, add the picture file and click to “hyperlink” icon on the tool bar(Figure 9).

Step 11:

Click to the city’s place on the map with mouse, the picture file is displayed(Figure 10).

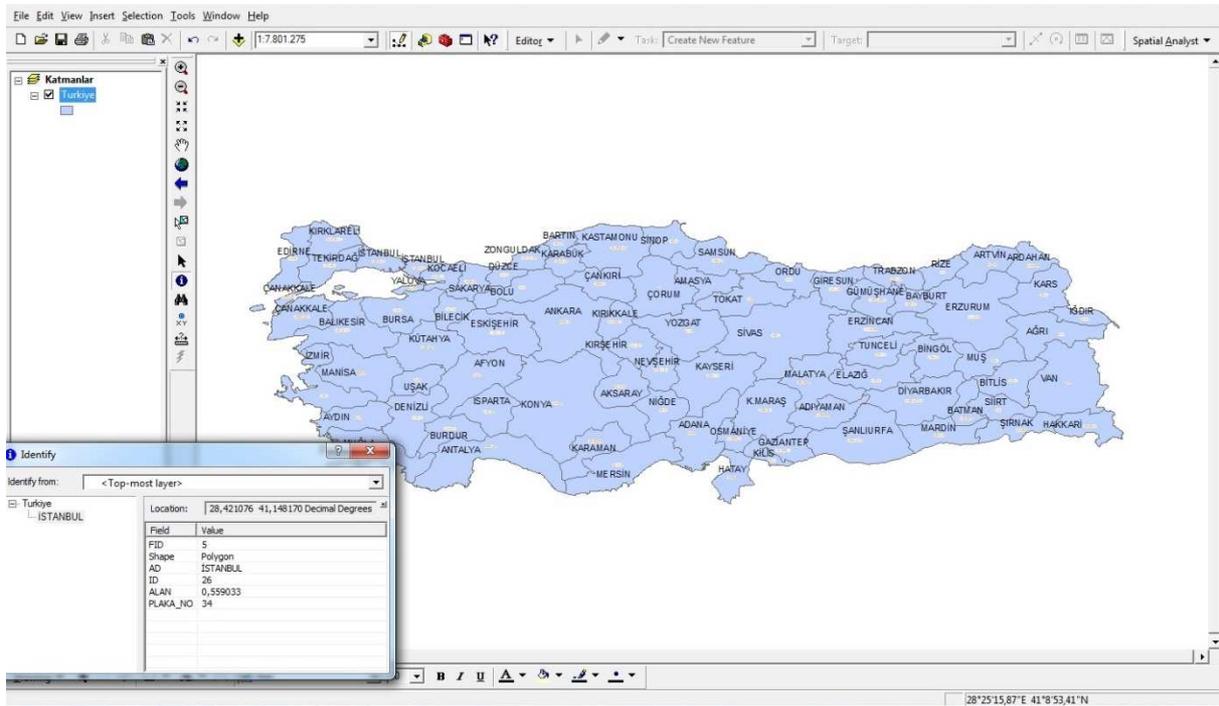


Figure 7: Step 8 is ArcMap application page about topic “Life in places” in the seventh grade social studies lesson (Esri licenced CD in Demirci, 2008).

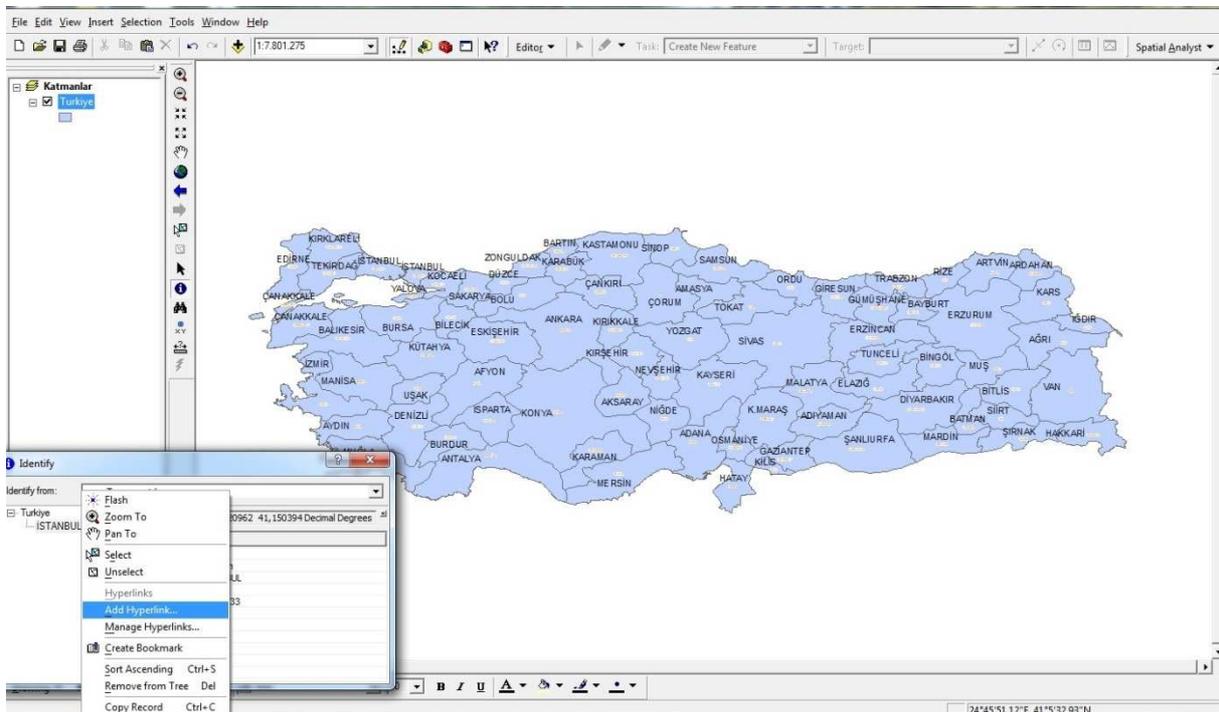


Figure 8: Step 9 is ArcMap application page about topic “Life in places” in the seventh grade social studies lesson (Esri licenced CD in Demirci, 2008).

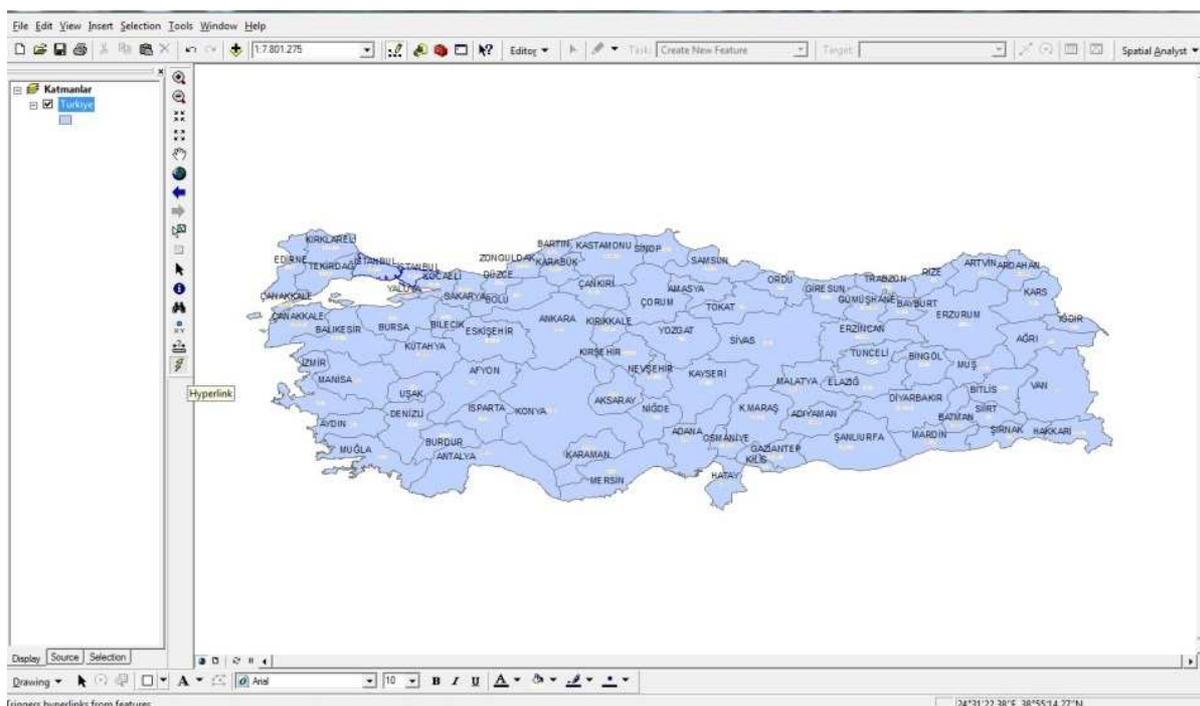


Figure 9: Step 10 is ArcMap application page about topic “Life in places” in the seventh grade social studies lesson (Esri licenced CD in Demirci, 2008).

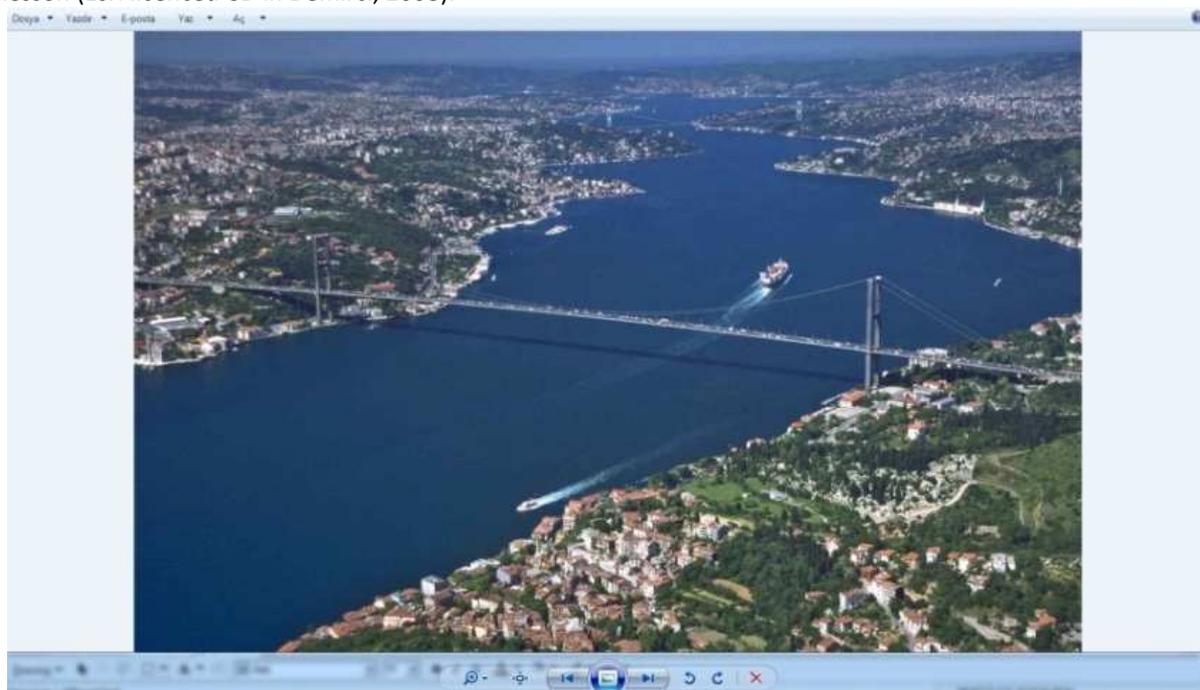


Figure 10: Step 11 is ArcMap application page about topic “Life in places” in the seventh grade social studies lesson (www.vikimapia.org).

DISCUSSION AND CONCLUSION

GIS-oriented applications have not been found in the lesson acquisitions in social studies curriculum. However in secondary education lesson acquisitions the applications about GIS are existing. Taş et al. (2007) said that in Turkey the first formal beginning about the using of GIS in high schools has been done in 2005. According to it,

in 2005 GIS has been located in new geography curriculum of ninth grade. Taş et al., 2007 mentioned that a survey had been applied to a hundred geography teachers in Turkey. According to the results eleven percent of geography teachers know software programs as ArcGIS and MapInfo, twenty two percent of them know and do not use, sixty seven percent of them do not know GIS software programs. About the advantages of GIS Wanner and Kersler (1999) said that "GIS accelerates the geographical interrogation in classroom environment". Bednarz and Van der Schee (2006) explained that "it encourages geography learning and teaching"(Demirci, 2008, p.67). GIS should take part in social studies curriculum as assistant component to teach lessons especially related to geography. That social studies teacher candidates and teachers should be conscious of geographical information systems and that they should be educated about GIS are very important. In conclusion, teaching of the topics especially related to geography in social studies lessons can be improved by using GIS technology. Thus, the courses will be transferred to the students visually and permanently.

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