

Full Length Research Paper

Travel journals based on Google Earth

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Google Earth, which is one of the newest tools of geographic information available on the Worldwide Web, has a strikingly great potential in providing students the opportunity to explore countries around the world. This article is about a class assignment designed to allow students to explore a European country with the help of the Google Earth Program. The assignment is based on asking university students taking a class in European geography to create a travel journal, following the instructions devised for this purpose by the researcher. The assignment entails instructing students to use Google Earth to do research along a particular itinerary in a European country, then turning this into a travel story. Eighty-four students at Balikesir University, Necatibey Faculty of Education, Department of Social Sciences Teaching participated in the project. The researcher developed a travel journal assessment scale to be used in interpreting the travel stories created by the students. The scale indicated that the characteristics of human geography along the routes were better described (70.6% students described these on an adequate level) than physical geographic characteristics (26.2% described them on an adequate level). In addition, a focus group discussion was held with the students in order to establish how Google Earth facilitated or hindered their efforts in creating a travel journal. The discussions showed that Google Earth provided a significant resource in the creation of a travel story but that some problems were experienced either due to the content of the program itself or because of student deficiencies in geographic knowledge, skills and perspective.

Key words: Geography education, Google earth, European geography, travel journal.

INTRODUCTION

Thanks to their speed and flexibility, as compared to classical methods of instruction, computers provide students a more rapid and effective means of reaching, organizing and making an assessment of geographic information (Geography Education Standards Project, 1994). It has become imperative today to offer students computer technology skills and to ensure that this knowledge is used throughout their lives. With their concentration on digital information processing and analysis, geographical information systems (GIS) make a huge contribution to the teaching of geography (Patterson, 2007). It can be seen that in recent years, parallel to advances in computer technology, there have been more studies conducted into how students may be taught to develop their GIS skills (Baker and White, 2003; Baker, 2005; Bednarz and Bednarz, 2004; Bowman et al., 2005; Cates et al., 2003; KanGIS, 2002; Meyer et al., 1999; Patterson, 2007). These studies refer to many obstacles that hinder the implementation of GIS. The most common obstacles cited in this context have been

restricted time frames, inadequate resources, a need for more training in understanding the software, the need to prepare material to support the lessons, and having to deal with the latest processing system models. Because of these barriers, the rich program of activities that GIS could provide at every level of education is an element that students are not adequately benefiting from (Baker, 2005; Bowman et al., 2005; Donaldson, 2000; Kerski, 2000). When compared with GIS, the relatively more restricted opportunities presented by Google Earth (GE), however, may be used in classroom environments because of the way it offers spatial knowledge that can be used in an interactive atmosphere by both teachers and students alike at every educational level (Patterson, 2007; Parkinson and Vannet, 2008; Richard et al., 2008).

As Leamson (1999) has pointed out, in many cases, learning may take place outside of the classroom. Students may make use of technology to expand their knowledge and develop their geographic skills. GE makes it possible to create lesson plans that foresee

students working independently on an interactive basis. The Internet-based resources within GE's content have the capacity to draw students into a learning atmosphere by providing them with more information on the locations that interest them (Patterson, 2007). In a class on European Geography, for example, students are generally happier when teachers present them with satellite images, air photos, video images and photographs in their teaching about countries in Europe (Brady, 1999). In addition to such contributions made by teachers, every day, computer programs, websites and other resources on geographic information about European countries are becoming more and more content-enriched. Besides offering students their own presentations, teachers also have to direct students to the resources that will foster their learning of the physical and human geography features of European countries. Studies have shown that using online resources contributes to an increase in students' geographic skills and knowledge (Solem and Gersmehl, 2005). As one of the most important of these resources, GE is a computer program that offers satellite images of the entire world in different resolutions. The emergence of the GE program provides a significant opportunity for geography education at every level and in every subject. Serving the virtual environment since 2005, the GE program has facilitated both students' and teachers' exploration of the European continent and other regions of the world.

In the present study, an assignment was devised to have students in a European Geography course who have never been abroad write a travel journal on a specified itinerary in a European country, making use of the GE program and following a set of instructions provided them. Travel journals could actually be more comprehensively prepared by using different resources (travel guides, regional geographic works of art, etc.). But this study restricted the content of the travel journal and the travel journal assessment scale to only what can be delivered with the GE program.

Purpose of the research

The research was undertaken for two purposes:

1. To ascertain the strong and weak aspects of the travel journal assessment scale which was developed to evaluate the travel journals the students prepared in accordance with the guidelines,
2. To establish through discussions with the students the kind of problems they experienced while preparing their travel journals using GE.

Significance of the study

The assignment of preparing a travel journal, which is the

subject of the present study, required the students to do research using GE and to produce creative stories. The students were asked to collect enough information about a particular place to be able to imagine the location and write a log about it as if they had been there or seen it in person. Writing a travel journal is a task that forces students to learn about a place in detail so that they can write about it without actually having been there. Writing an imaginative story requires them to do research and describe the information and images they see on GE as if they were geographers. This type of student-centered work allows teachers the opportunity to understand the level of skills students display in gathering geographic information and then organizing and analyzing this knowledge. The present study is useful in that it proposes some guidelines for preparing travel journals as well as a travel journal assessment scale that can be used with little effort in a European Geography course or in courses on other world regions.

Literature review

The number of studies on the use of travel journals in the teaching of geography is few. As far as the present researcher knows, the literature reveals only a limited number of studies on travel journals (Brady, 1999; Rodrigue, 1996; Walker, 1996) and none of these are works of scientific research published in the last ten years. In a study by Rodrigue (1996), students were given the assignment to write creative stories that would lead them to learning about different cultures. As part of the assignment, the students researched minority cultures in California and used the knowledge they gained to compose imaginative stories. In writing about the history of family migrations, the students, who all came from different racial backgrounds, increased their knowledge of California's cultural history. Rodrigue used creative writing as a tool in contributing to the elimination of communication difficulties with the minorities of California. Rodrigue noted that students were not experienced in writing imaginary geographic stories and that teachers had to direct them in some way to help them in this task.

In a study by Walker (1996), it was reported that by writing travel stories, students not only learned more about geography but also developed their research and writing skills. A study by Brady (1999) revealed that students were asked to write about a route through a world region of their choice as if they had actually been there. Brady required the students to mention in their travel journals important physical and cultural differences they came across along the course of their itinerary, thus encouraging them to write down not only their impressions of the cities but of everything they saw along the way. This assignment opened the way for the students to access information and maps on the

Table 1. Travel journal findings.

Sub-scales	Items	Level of Adequacy					
		Adequate		Partially Adequate		Inadequate	
		Number of students	%	Number of students	%	Number of students	%
Physical geography characteristics of the route	Landforms	21	25.0	29	34.5	34	40.5
	Vegetation	19	22.6	35	41.7	30	35.7
	Hydrology	26	31.0	40	47.6	18	21.4
	Mean (%)	26.2		41.3		32.5	
Human Geography Characteristics of the Route	Settlements	65	77.4	11	13.1	8	9.5
	Transportation	60	71.4	15	17.8	9	10.8
	Culture	53	63.1	19	22.6	12	14.3
	Mean (%)	70.6		17.9		11.5	

particular region and to analyze this knowledge as well. Brady reported that the students did some substantial research while preparing their assignment, that they enjoyed writing a travel journal and that this writing assignment increased their interest in the region that they were researching.

METHODOLOGY

Subjects

The subjects in this research comprised 84 third-year students who were taking a course in European Geography in three different sections of the Balikesir University Social Studies Teaching Department during the academic year 2008-2009. Forty-four of these students were women, 40 were men.

Instrument

The researcher partially based the formulation of the items on the travel journal assessment scale on the travel story instructions set up by Brady (1999). The draft form of the assessment scale was composed of 2 subscales with 3 items on physical geography observations and 4 on human geography characteristics. These were presented to specialized academics in geography education for their review and evaluation. After the scale was reviewed and assessed by the specialists, in accordance with the suggestions made, one of the items (economic activities) was removed from the scale.

The travel journal assessment scale, which constituted the instrument of measurement used in the study, was composed of 2 sub-scales with a total of 6 items, 3 of which referred to "observations of physical geography" and 3 to "observations of human geography" (Table 1). The sub-scale's items on physical geography were made up of observations on landforms, vegetation, and hydrological characteristics. The items in the sub-scale of observations related to human geography constituted observations on units of settlement, transportation and cultural characteristics. The students' travel journals were assessed according to the adequacy of each item (adequate, partially adequate, and inadequate).

Data collection and analysis

Data was obtained from discussions held with the students and

from their travel stories. The researcher prepared travel journal instructions (Attachment A) on the basis of the suggestions of the reviewing geography educators. The instructions explain, step-by-step, how students are to compose their travel journals using GE. The texts of the travel journals written by the students in the light of these guidelines were reviewed in detail by the researcher.

The travel journal assessment scale was used in the analysis of the data. The level of adequacy of each student's travel story was first determined according to each item on the scale (adequate, partially adequate, and inadequate). The level of adequacy was ascertained according to how well the geographic characteristics of the travel route were described. In assessing the three different levels of adequacy for each item, the number of students and frequency at each level were calculated. The general mean values and frequencies (%) on the two sub-scales (observations on physical and human geography) were each separately calculated (Table 1). Table 2 shows the adequacy level (Adequate: 2; Partially adequate: 1, Inadequate: 0) of each item of the students' observations on physical and human geographic characteristics. Using the method of focus group discussions, a qualitative research strategy (Patton, 2002), interviews were held with 5 groups of 10 students each (a total of 50 students). Each interview took approximately one hour. The discussions were recorded on tape. The groups were arranged so that students displaying all three different levels of adequacy were together.

The questions to be asked in the interviews were determined after the travel journals were assessed in terms of the assessment scale. Depending upon the flow of the discussion, the researcher asked students to clarify and detail their answers to the different items in the subheadings. The questions that were asked of the students in accordance with the suggestions of the specialists were as follows: 1. What kind of problems did you encounter in preparing your travel journal using GE? 2. How did GE facilitate the preparation of your assignment? 3. Did GE sufficiently allow you to discover the physical (landforms, vegetation, hydrology) and human (settlements, transportation, culture) geographical characteristics of the locations on your itinerary? 4. If you were asked to repeat this assignment, what would you do differently? In reporting the interview data, the students were assigned code numbers in the series S (student) 1, S2, S3...S84.

FINDINGS

The findings gleaned from the travel journals will be reviewed here in three headings: findings related to

Table 2. Adequacy level of students' geographic observations.

Student	Country	Score	Observations on physical geography									Observations on human geography								
			Landforms			Vegetation			Hydrology			Settlements			Transportation			Culture		
			Adequate	Partially adequate	Inadequate	Adequate	Partially adequate	Inadequate	Adequate	Partially adequate	Inadequate	Adequate	Partially adequate	Inadequate	Adequate	Partially adequate	Inadequate	Adequate	Partially adequate	Inadequate
1	Spain	9	-	-	x	x	-	-	-	x	-	x	-	-	x	-	-	x	-	-
2	Spain	12	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-
3	Spain	4	-	-	x	-	-	x	-	x	-	x	-	-	-	-	x	-	x	-
4	Spain	3	-	-	x	-	x	-	-	-	x	-	x	-	-	x	-	-	-	x
5	Portugal	6	-	-	x	-	-	x	-	x	-	x	-	-	-	x	-	x	-	-
6	Portugal	4	-	x	-	-	-	x	-	-	x	-	x	-	-	x	-	-	x	-
7	Portugal	10	-	x	-	x	-	-	-	x	-	x	-	-	x	-	-	x	-	-
8	Portugal	12	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-
9	France	10	x	-	-	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-
10	France	3	-	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-	-	x
11	France	5	-	-	x	-	-	x	-	x	-	x	-	-	-	x	-	-	x	-
12	France	12	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-
13	United Kingdom	12	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-
14	United Kingdom	10	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-	x	-	-
15	United Kingdom	10	x	-	-	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-
16	United Kingdom	6	-	-	x	-	x	-	-	x	-	-	-	x	x	-	-	x	-	-
17	Norway	6	-	-	x	-	x	-	-	x	-	-	x	-	x	-	-	-	x	-
18	Norway	10	-	x	-	x	-	-	-	x	-	x	-	-	x	-	-	x	-	-
19	Norway	10	x	-	-	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-
20	Norway	4	-	x	-	-	x	-	-	-	x	-	-	x	-	x	-	-	x	-
21	Sweden	10	x	-	-	x	-	-	-	-	x	x	-	-	x	-	-	x	-	-
22	Sweden	9	-	x	-	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-
23	Sweden	11	-	x	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-
24	Sweden	5	-	-	x	-	-	x	-	x	-	-	x	-	-	-	-	-	x	-
25	Finland	8	-	x	-	-	x	-	-	-	x	x	-	-	x	-	-	x	-	-
26	Finland	12	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-
27	Finland	5	-	-	x	-	-	x	-	x	-	-	x	-	-	x	-	x	-	-
28	Finland	10	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-	x	-	-
29	Belgium	2	-	-	x	-	-	x	-	-	x	-	-	x	x	-	-	-	-	x
30	Belgium	10	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-	x	-	-

Table 2. Continued.

31	Belgium	9	-	x	-	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-
32	Belgium	9	-	x	-	-	-	x	x	-	-	x	-	-	x	-	-	x	-	-
33	Holland	8	-	-	x	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-
34	Holland	10	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-	x	-	-
35	Holland	10	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-	x	-	-
36	Holland	6	-	-	x	-	-	x	-	x	-	x	-	-	x	-	-	-	x	-
37	Denmark	9	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-	x	-	-
38	Denmark	3	-	x	-	-	-	x	-	-	x	-	-	x	-	x	-	-	x	-
39	Denmark	8	-	-	x	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-
40	Denmark	7	-	-	x	-	x	-	-	x	-	x	-	-	-	x	-	x	-	-
41	Germany	3	-	-	x	-	-	x	-	x	-	-	x	-	-	-	x	-	x	-
42	Germany	11	x	-	-	-	x	-	x	-	-	x	-	-	x	-	-	x	-	-
43	Germany	8	-	-	x	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-
44	Germany	9	-	x	-	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-
45	Italy	12	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-
46	Italy	3	-	x	-	-	-	x	-	-	x	-	x	-	-	x	-	-	-	x
47	Italy	11	-	-	x	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-
48	Italy	4	-	-	x	-	-	x	-	x	-	x	-	-	-	-	x	-	-	x
49	Switzerland	5	-	x	-	-	-	x	-	-	x	x	-	-	-	x	-	-	x	-
50	Switzerland	4	-	-	x	-	-	x	-	x	-	x	-	-	-	x	-	-	-	x
51	Switzerland	9	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-	-	x	-
52	Switzerland	8	-	-	x	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-
53	Austria	12	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-
54	Austria	8	-	x	-	-	-	x	-	x	-	x	-	-	x	-	-	x	-	-
55	Austria	2	-	-	x	-	-	x	-	-	x	-	-	x	x	-	-	-	-	x
56	Austria	7	-	-	x	-	-	x	-	x	-	x	-	-	x	-	-	x	-	-
57	Czech Republic	9	-	x	-	-	-	x	x	-	-	x	-	-	x	-	-	x	-	-
58	Czech Republic	7	-	-	x	-	x	-	-	x	-	x	-	-	x	-	-	-	x	-
59	Czech Republic	4	-	-	x	-	-	x	-	x	-	-	x	-	-	-	x	x	-	-
60	Czech Republic	9	x	-	-	-	-	x	-	x	-	x	-	-	x	-	-	x	-	-
61	Hungary	3	-	-	x	-	x	-	-	-	x	x	-	-	-	-	x	-	-	x
62	Hungary	5	-	-	x	-	-	x	-	x	-	x	-	-	-	x	-	-	x	-
63	Hungary	11	x	-	-	-	x	-	x	-	-	x	-	-	x	-	-	x	-	-
64	Hungary	5	-	-	x	-	x	-	-	-	x	-	x	-	-	x	-	x	-	-
65	Romania	6	-	x	-	-	-	x	-	x	-	x	-	-	x	-	-	-	-	x
66	Romania	11	x	-	-	x	-	-	-	x	-	x	-	-	x	-	-	x	-	-
67	Romania	5	-	-	x	-	-	x	-	x	-	-	-	x	x	-	-	x	-	-

Table 2. Continued.

68	Romania	4	-	x	-	-	-	x	-	-	x	x	-	-	-	-	x	-	x	-
69	Croatia	5	-	-	x	-	-	x	-	x	-	-	x	-	-	x	-	x	-	-
70	Croatia	4	-	-	x	-	x	-	-	-	x	x	-	-	-	-	x	-	x	-
71	Croatia	10	x	-	-	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-
72	Croatia	8	x	-	-	x	-	-	-	-	x	x	-	-	x	-	-	-	-	x
73	Bosnia and Her.	9	-	x	-	-	x	-	x	-	-	x	-	-	x	-	-	-	x	-
74	Bosnia and Her.	2	-	-	x	-	-	x	-	-	x	x	-	-	-	-	x	-	-	x
75	Bosnia and Her.	10	x	-	-	-	x	-	x	-	-	x	-	-	x	-	-	-	x	-
76	Bosnia and Her.	10	-	x	-	x	-	-	-	x	-	x	-	-	x	-	-	x	-	-
77	Greece	12	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-
78	Greece	10	x	-	-	-	-	x	x	-	-	x	-	-	x	-	-	x	-	-
79	Greece	2	-	-	x	-	x	-	-	-	x	-	-	x	-	-	x	-	x	-
80	Greece	11	-	x	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-
81	Bulgaria	7	-	x	-	-	-	x	-	x	-	x	-	-	x	-	-	-	x	-
82	Bulgaria	3	-	-	x	-	x	-	-	-	x	-	-	x	x	-	-	-	-	x
83	Bulgaria	12	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-
84	Bulgaria	9	-	x	-	-	x	-	-	-	x	-	-	x	-	-	-	x	-	-
Total			21	29	34	19	35	30	26	40	18	65	11	8	60	15	9	53	19	12
Percentage			25.0	34.5	40.5	22.6	41.7	35.7	31.0	47.6	21.4	77.4	13.1	9.5	71.4	17.8	10.8	63.1	22.6	14.3

observations of physical geography, findings related to observations of human geography and findings related to the discussions.

Findings obtained from observations on physical geography in the travel journals

A review of the students' travel journals in terms of the assessment scale showed that characteristics of human geography of the locations on the itineraries were more adequately described (70% were adequate) than physical geography characteristics (26.2% were adequate). This is seen in Table 1.

Findings related to landforms

Along the chosen routes, one or several landforms belonging to fluvial, karst, glacial, arid region, volcanic or coastal topography might have been encountered. The students were expected to be aware of the significant landforms and to describe them in a geographic context. Levels of adequacy (adequate, partially adequate, and inadequate) were determined according to the degree to which these expectations were met. Students who adequately mentioned landforms (25%) showed awareness of significant landforms along the route and were able to describe these in geographic terms. For example, the geographic descriptions included Student No. 19's (S19)

narrative of the fjords in the regions where old glacial valleys, lined side by side, and boats had been ravaged by the seas in and around Bergen (Norway), S71's description of the islands, canals, bays and gulfs parallel to the coast along the shores of Dalmatia (Croatia), and S42's story of discovering the meanders formed at the base of the plains along the Rhine in the south of Mannheim (Germany).

The students who provided partially adequate descriptions of landforms (34.5%) were aware of some of the landforms that should have been described but missed others. For example, S14 stressed the wide presence of deep valleys and glacial lakes in the north of the United Kingdom but failed to mention the steepness of the

coasts. S34 stated that, the Zeeland Region (Netherlands) was composed of islands but did not mention that these islands lay between large river estuaries. Some of the students (40.5%) described the landforms inadequately or did not mention them at all. Examples of these were S24, who failed to mention the mountainous region and the periglacial forms encountered in the immediate north of the settlement of Are (Sweden), S27, who did not include the presence of the island and islets in the mouth of the Gulf of Bothnia along the route of the Turku-Aland Islands (Finland), S29, who ignored the existence of the estuary in the region where the harbor of Antwerp is located (Belgium), and S55, who said nothing about the valley through which the highway passed through along the Innsbruck-Bregenz (Austria) route and the surrounding mountain chain of the Alps.

Findings related to vegetation

Different types of vegetation (forests, shrubs and grass formations) can be encountered along the itineraries. The students were expected to evaluate the changes in vegetation that they spotted along the routes they traveled and describe the factors that caused these changes. Levels of adequacy (adequate, partially adequate, and inadequate) were determined according to the degree to which these expectations were met.

The students who adequately mentioned vegetation (22.6%) observed the clusters of vegetation along their travel routes and described, in geographic terms, the changes they saw, along with the factors that caused these changes. For example, S1 described the effect of the Mediterranean climate on the inner parts of the Ebro Valley (Spain), relating that scrubs existed on the slopes of the valley. S76 described the changes in the groups of vegetation along the Neretva Valley of Bosnia-Herzegovina caused by the elevation and exposure, stating that all through the length of the valley, one could see forests, shrubbery as well as grass formations. S23 emphasized the presence of tundra's in the terrain surrounding the glacial lakes in the north of Sweden.

The students who described vegetation only in partial adequacy (41.7%) were aware of some significant vegetational characteristics but unaware of others. For example, S25 spoke of the existence of dense forests all along the route through the middle regions of Finland but did not mention that these forests were composed of coniferous trees. S31 related that the pastures and shrub formations in the central regions of Belgium later turned into regions of extensive forests along the way to Ardennes but failed to say that this change of vegetation was the result of elevation and the increase in precipitation.

A portion of the students (35.7%) were either

inadequate in their description of vegetative characteristics or did not mention this at all. For example, S41 never wrote of the existence of pastures and forests in the region of Germany's Bavarian Alps, S62 did not mention the sparsely vegetated steppes along the route going through the Hungarian plains, and S56 failed to mention the forests covered with needle-like leaves along the slopes of the Inn Valley (Austria), nor did the same student write of the alpine meadows at the higher elevations.

Findings related to hydrological characteristics

The students were expected to use GE to make a geographic description of the important hydrological features (streams flowing into the sea, watershed, the formation of lakes, etc.) that they observed along the itinerary of their travels. Levels of adequacy (adequate, partially adequate, and inadequate) were determined according to the degree to which these expectations were met.

Students who adequately described hydrological characteristics (31.0%) were aware of these features and described them in geographical terms. For example, S13 mentioned observing from an airplane the way the Thames River reached the estuary by curling through the city of London (UK). S26 wrote about the complexities and breakdowns in the drainage network in the Central Lakes Plateau in Finland. S35 related how the widespread network of waterways formed by the branches and canals of the Rhine River around Western Europe's busiest harbors, Rotterdam and Amsterdam (Netherlands), served as a connection to the inland parts of the country and the inner regions of Central Europe. S53 wrote about frequently encountering ships along the Danube River in Austria and that this indicated that the water course and flow were conducive to transport over the waterways.

Students whose mention of hydrological characteristics was partially adequate (47.6%) were aware of some of the hydrological features along their routes that should have been described but yet did not see others. For example, S22 spoke about the lakes that were frequently encountered along the Stockholm-Goteborg (Sweden) route but did not mention that most of these had been created by glaciers; S44 talked about the existence of the Rhine, Main and Danube Rivers in the south and southwest of Germany yet did not say anything about these rivers being connected by a canal (the Rhine-Main-Danube Canal). Some of the students (21.4%) inadequately described the hydrological features on their itinerary or otherwise did not mention these at all. For example, S46 did not refer to the lagoon in Venice (Italy), S68 did not mention that the Danube branched off at the Danube Delta (Romania) and that there were coastal lakes in the area.

Findings obtained from observations on human geography in the travel journals

Findings about Settlements

There were many different sizes of settlements along the travel itineraries. The students were expected to describe the geographic characteristics (situation, settlement type, functions, sightseeing locations, social locations, lodgings, etc) of the settlements they encountered along their travel routes. Levels of adequacy (adequate, partially adequate, and inadequate) were determined according to the degree to which these expectations were met.

The students who adequately described the geographical characteristics of settlements (77.4%) were able to notice and describe significant geographic features of the settlements in their path. An example was S35 who said that the canals of Amsterdam (Netherlands) looked like those in Venice, describing the magnificent buildings surrounding the Dam Square, and speaking of the fact that there was an important harbor there as well as shipbuilding facilities, windmills, tulip gardens and parks, and touching upon the restored historical bridges over the canals. S48 mentioned that Rome was in the west of Italy and 10 km inland from the coast of the Mediterranean, that the city was built on hills, that it had a rich historical legacy, that the Vatican was located within the city boundaries, that the Colosseum was the most exciting spot to see in the city and that there were famous fountains there. S74 wrote that Sarajevo (Bosnia-Herzegovina) is located on the Miljacka River and is one of the country's most important economic, administrative, cultural and educational centers, that it has mosques, Orthodox cathedrals and synagogues, also speaking of the sebilj that is the symbol of the city.

The students who were only partially adequate in their descriptions of the geographic characteristics of the settlements (13.1%) were aware of some of the settlements that could be described but yet failed to see others. For example, S4 said that Barcelona (Spain) is located on the shores of the Mediterranean, that it is one of the most important harbors in the Mediterranean and that a visit had been paid to the museum where Picasso's works were exhibited but yet never mentioned the Church of La Sagrada Familia or that there were ferry rides from Camp Nou to the Balear Islands and that the city was an important industrial center, S17 provided the information that Hammerfest (Norway) was in the north of the country, that it had a small airport, that it was a fishing town and that there were fjords surrounding it, yet this student did not mention that it was on the coast of the Arctic Sea Ice and never touched upon the nomadic lifestyle of the Sami people or talked about their traditional houses or the arctic lights.

Some of the students (9.5%) either inadequately described the geographic characteristics of the settlements

along their routes or else failed to mention them at all. For example, S67 did not mention that Bucharest (Romania) is located in the south of the country, that one branch of the Danube passes through the city, that the city has a planned layout, that it has a commercial center, that tourists are drawn to the city for its churches, statues and museums. S82 failed to mention that Varna (Bulgaria) is located in the east of the country and that it is an important Black Sea port, that there are many facilities for tourism near the coastal beaches, also never mentioning the shipbuilding facilities or the universities or the existence of commerce and the fishing industry.

Findings on transportation

Along the routes were various vehicles of transportation that operate in and between cities (busses, rental cars, subways, trams, trains, rapid transit trains, ferries, etc.) as well as different modes of travel (highways, railroads, seaways). The students were expected to write in their travel journals what the most convenient route would be (containing geographically rich features), to decide upon the vehicle, the mode of travel and to consider distances and travel time. Adequacy levels of description (adequate, partially adequate, and inadequate) were determined on the basis of the degree to which these expectations were met.

Students who adequately mentioned the features of transportation along their itineraries (71.4%) were able to perceive and describe them. For example, S36 mentioned the bicycle paths and bicycle parks in Amsterdam (Netherlands), stating that the city was the center of a very developed bicycle culture and therefore many streets and avenues had been closed off to traffic, that public transportation was provided with busses and trams and that the canals also provided public transportation with water taxis and seabusses, with small boats offering tours along the canals. S28 wrote about Helsinki (Finland), where one rode the bus, subway or tram to get around the city and that at the subway and tram stops one could find location directions in Finnish, Swedish and English, that multi-story ships or small fast-boats were available to take passengers to the capital of Tallinn, which was at a close distance by sea. The student also said that there were icebreaker ships moored at the harbor, motor boats, sailboats and yachts available for tours along the coast, and that it took a 1.5 h trip over land to get to Tampere.

The students whose descriptions of the transportation features were only partially adequate (17.8%) were aware of some of the features of the transportation along their route but not of others. For example, S20 said that in Oslo (Norway), inhabitants used their private boats and motor-boats to travel, spoke of making an exploration tour of the fjords on a ship, noting the many shipmaking facilities and mentioning the fishing boats but not saying anything about the city's roads leading to Bergen and the

distance in-between and not mentioning the types of transportation that were available in the city. S49 talked about going around in Basel (Switzerland) on a tram, that there were signs at every tram-stop indicating when the tram would arrive, that there were major roads coming in from Germany and France, yet never mentioned the Rhine River passing through the city and the importance of the Rhine and other rivers in terms of general transportation.

Some of the students (10.8%) were inadequate in their description of the features of transportation in the places on their itinerary. For example, S48 never mentioned that since in Venice (Italy), transportation has to be over water or otherwise on foot, many canals and bridges connect the little islets of the city or that there are no motor vehicles but seabusses and gondolas that travel from one place to another. S68 wrote about Costanta (Romania) but never mentioned the great number of commercial ships and fishing boats along the Black Sea coast, or that the city was connected to the capital of Bucharest by well-developed railways and a network of highways, that the Danube was connected to the city through its canal or that one could travel in the city by trolley, tram and busses.

Findings related to culture

The students were expected to write in their travel journals about the cultural characteristics of the inhabitants of the places along their travel itineraries. In doing this, they were instructed to describe the cultural geography of the locations (buildings, roads, fields, architecture, social structures, religion and languages, dress, food culture, alphabet, etc.). The adequacy level of their descriptions on the culture encountered along their routes was measured by what they had and had not expressed about cultural geography.

The students who produced adequate descriptions of the cultural characteristics of the locations on their itinerary (63.1%) were able to reflect the cultural geography of that place. For example, S53 wrote that in Vienna (Austria), the old city center was listed as a World Heritage City, referring to the city's symbol, St. Stephan's Cathedral, speaking of how the city was rich in green areas, that the signs in the city were in German, that there were stores selling Mozart chocolates and Mozart momentos, and that there was a predominance of Catholic churches in the city. S26 mentioned that Helsinki (Finland) had an abundance of statues in its parks and squares. The student also spoke of visiting a Finnish Bath House, that most of the population was Protestant, referring as well to the widespread presence of shipbuilding facilities and furniture manufacturers, to experiencing the white nights, mentioning the church that was carved into the rock and about drinking Finnish vodka.

The students who referred to cultural characteristics on a partially adequate level (22.6%) were aware of some of the cultural geography on their routes but failed to notice others. For example, S17 mentioned discovering Viking ships in the museums of Oslo (Norway), seeing churches dating back to the Middle Ages, noticing churches made of wood, remarking that many people in the population had white skin and red hair, but not saying anything about how people were dressed, how many restaurants there were offering seafood and how the city had an established fishing culture. S79 said that there were whitewashed buildings to see on the Island of Mykonos (Greece), mentioning the hotels and boardinghouses with their balconies projecting over the scenic view but not the many sloped, stone-paved, curling streets, the windmills, the entertainment spots that featured Greek music, the fish restaurants, the souvenir shops or the island's Orthodox church.

A portion of the students (14.3%) were inadequate in their descriptions of the cultural features of the places on their itineraries. For example, S4 did not mention that one of Europe's biggest cathedrals was in Seville (Spain), that there were venues where Flamenco dances were presented, that the city had a bull-fighting arena, also saying nothing about the traces of Andalusian civilization. S74 made no mention of the traces of the Roman and Ottoman Empires in Sarajevo (Bosnia- Herzegovina), nor of the mosques and churches, said nothing about the historical stone bridge, of the widespread layout of the one- or two-storied old houses, the narrow and sloping cobblestone streets or that the language spoken was Bosnian and that the city's inhabitants were of many different ethnic backgrounds.

Findings gathered from the discussions

The students had some problems in writing up their travel journals using the GE Program. These difficulties are summarized below, in the students' own words.

"...Because visibility is so low in most parts of my country (Romania), I could not adequately observe the streets, houses, rivers, mountains, etc. ..." (S65)

"...Because there were some locations on the way that were camouflaged, I wasn't able to see them. Even though I got very close to the land, it was not enough to make a geographic observation..." (S80)

"...I had difficulty translating the texts. I had a hard time since I don't know enough English and most of the texts and the image captions were in English. The translation programs that I used for translating the texts did not give me a comprehensible translation..." (S37)

“...It was hard for me to make my observations because there were no street images in my country...” (S68)

“...I had trouble getting information or images from GE so I had to go to other websites to search for reliable information ...” (S43)

“...My biggest problem was not having a PC. That's why I had to spend hours at a time at Internet cafés. If I had had a PC and an Internet connection at home, I could have prepared a much better assignment. I spent about a total of 20 hours on different days to do the assignment at the Internet café. Some of my friends spent about 10 hours a day at the computer...” (S40)

“...The assignment took me a long time to complete. I needed a lot of time to write up a detailed and good assignment. I left the assignment for the last minute. Even though you gave us the assignment a month ago, I did it in the last week...” (S5)

“...The GE user's guide is very long, mixed up and confusing so I had difficulty in benefiting from it...” (S36)

“...When I had difficulty in gathering information on my itinerary from GE or just to make my assignment richer, I benefited from the travel stories and notes of people who had gone to the same places. I logged into the web pages of some travel agencies. I looked at the travel programs they organized for my itinerary and used part of that content for my own assignment ...” (S7)

“...Because my Internet connection is slow, accessing new images each time took up a lot of time. I had to wait a long time to get the detail of any image...” (S50)

“...I have an old computer that's very slow so my exploration of GE took a lot of time. The program is comprehensive but slow. You need to have time and patience because it works so slowly....” (S70)

“...The resolution of the images on the routes between cities was low so I couldn't make adequately detailed observations. I was just able to talk about the cities...” (S67)

“...Some of the satellite images of the places on my itinerary were outdated so there have probably been some changes since that time. Not being able to see these changes might have contributed to the inadequacy of my observations...” (S62)

“...Some of the cities had a lot of geographic elements that were worth looking at but I had trouble planning my trip and couldn't decide how and where to spend the limited time I had...” (S79)

“...Some of the photographs didn't belong to the locations they were in. There was an image of the Istanbul Bosphorus Bridge, for instance, where the Chain Bridge in Hungary should have been...” (S64)

“...My computer skills aren't very good so this made it harder for me to make my observations...” (S61)

Reviewing the notes taken from the recorded interviews with the students showed that the students indicated that they had experienced some difficulties in preparing their travel stories using the GE program. These difficulties stemmed from the content of the service the GE program provided, from the scope of the assignment, the students' knowledge of geography, their limitations in terms of the necessary skills and also from technical shortcomings. Because the services provided by the GE program exhibited differences depending upon the location, it can be said that there was an unfair distribution of conditions between students and also between any one student's opportunities to get to know different places. According to the students' statements, the problems arising from the content of the services provided by the GE program were the following: The three-dimensional resolution of the program showed differences from location to location; some locations seemed to be camouflaged for one reason or another; some services were not provided for some locations (e.g., street images); from time to time the data and images were not reliable; some locations were problematic in providing information and images and therefore necessitated having to resort to other resources; some images and information were outdated; and the GE user's guide seemed confusing and not user-friendly. The findings culled from the interviews indicated that other problems encountered in the preparation of the travel journals were the inadequate level of knowledge and skills of the students in the subject of geography and insufficient technical support. Some of the students did not have a personal computer, some had poor computer skills and others had trouble translating the material, all of which prevented them from handing in quality work.

The results of the analysis of the students' travel journals using the travel journal assessment scale supported the views that were expressed. Differences were seen between the travel journals of different students and also between the observations of the same student about elements of physical and human geography (Table 2). It can be said that these differences were to a large part affected by the problems cited above. It was only natural that students who could give an appropriate length of time to the assignment, who did not experience problems in the translation, who were adequately skilled with the computer, whose travel

itineraries were in regions for which GE provided high resolution, updated images and information and a rich variety of services were at an advantage compared to other students in their preparation of a high-quality assignment, or at the least it was a fact that the mentioned problems did not become an obstacle for them.

On the other hand, it should not be concluded that the students who did not experience these difficulties necessarily were able to prepare a quality assignment. It is also true that it is not possible for students who do not take the assignment seriously and do not spend enough time on it to produce a work of good quality. As an example, although the services provided by the GE program for Germany, France and Italy are abundant, some of the students who wrote travel journals about these countries (S10 France, S41 Germany and S46 Italy) produced inadequate observations (Table 2).

In writing their travel stories using the GE Program, the students made use of many elements of the program that facilitated their work. The following are what the students said about these elements:

"...The street images made me feel as if I was actually there in that area, walking on the streets..." (S26)

"...It's exciting to know that if I really went to the places I've been working on in my travel journal, that I would not see anything different than what I saw in the three-dimensional images..." (S56)

"...GE can be a guide to where and what you can see before you actually go to a particular country. I can plan my trips using GE. From now on, whenever I'm planning to go somewhere I've never been, I will study that place on the GE program first and then make my travel plans..." (S66)

"...I will definitely use the GE program as an educational tool in my professional life. If I can hook up a computer, projector and an Internet connection, I will definitely incorporate this program in the content of my lessons..." (S23)

"...When I become a teacher and I am teaching topics in Geography, I will use the GE program. The program is a treasure of innumerable geographical evidence. I think I can find many pieces of evidence in GE to support everything I say in class. For instance, I can show the olives on an olive tree along the coast of the Mediterranean in Italy on GE and talk about the Mediterranean climate ..." (S47)

"...I can measure distance by air between two points with GE..." (S74)

"...I can see landforms and buildings three-dimensionally on GE. I can pick out and differentiate the mountains, valleys, heights and summits..." (S72)

"...I can get directions for the best way to get from one place to another with GE. This can be helpful to me all my life when I want to decide on an itinerary for any trip I take..." (S71)

"...I can access all the information and images I want about a place with GE. Instead of finding out about the geographic characteristics of a place on the Internet one by one, I can click onto whatever I want to and access it very conveniently..." (S25)

A review of the comments of the students that were recorded during the interviews shows that the GE program generally facilitated the work of the students during their assignments. The services provided by the program (three-dimensional images of streets, landforms and buildings, distance measurements, road directions, etc.) helped the students get to know and look at their travel routes and the places along the way on their computer screens. As can be gathered from the interview notes, teacher candidates state that they will use the GE program in teaching topics of geography in their future classes, in planning their own trips and whenever they want to access information and images about a particular location.

In evaluating the students' travel stories according to the travel journal assessment scale, it can be seen that the students who were aware of the ways the program could facilitate their work, who adequately benefited from these and also had strong geographic observation skills produced good quality assignments (S2, S8, S12, S13, S26, S45, S53, S77, S83). Despite the convenience that GE offers, if a student does not have an adequate command of geographic information, skills and perspective, or if the student does not take the assignment seriously, there is limited possibility that the travel journal produced by that student can be of high quality. Preparing a travel journal with the help of GE provides the opportunity to explore many geographic features. Below are some views expressed by the students on whether the program was an adequate source in allowing them to learn about the characteristics of physical geography (landforms, vegetation, and hydrology) and human geography (settlements, transportation, culture).

"...GE provides a better opportunity to make observations about human geography..." (S1)

"...Making observations about transportation using GE was the easiest. The data on intra-city and intercity transportation was considerably abundant..." (S14)

“...Identifying and describing transportation, cultural and settlement characteristics were more appealing to me than making observations of physical geography...” (S 60)

“...It was very easy to write about the cultural characteristics of the places on my route using the photographs and street images in GE. I wrote about what people wore, the restaurants and their menus...” (S 42)

“...I was very impressed with the three-dimensional historical buildings and this was very helpful to me. I was able to discover the styles of architecture in this way...” (S35)

“...I was able to get some information about how people dressed in places that I had never been before as well as about the architectural characteristics of these locations ...” (S2)

“...Contrary to what would happen with tour programs, we made our own decisions about where we would go along our route. Even if it was our instructor who gave us the route, it was still exciting to decide where we would go and what we would do ...” (S53)

“...I had difficulty making physical observations. I had a hard time seeing the seas and the waterfalls. I couldn't explore some of the physical features that are mentioned in travel websites...” (S 24)

“...Data on small towns were limited...” (S 6)

The excerpts given from interviews with the students show that in the process of preparing their travel journals using GE, the students found that learning about characteristics of human geography on their routes was easier than exploring features of physical geography. Using GE for making observations on physical geography necessitated the knowledge of how to use the services offered by the program and having an adequate knowledge of geographic information, skills and perspective. The students needed to familiarize themselves with the GE user's guide for this. Students who did not take this into consideration may have been unsuccessful with their travel stories for this reason. The content of GE is such that the program has a greater potential for offering the opportunity to make observations on human geography. In terms of the travel journal assessment scale, it was seen that the students' observations on human geography were at a more adequate level than their observations on features of physical geography (Tables 1 and 2).

To the question about what they would do if they had to prepare the same assignment once again, students said the following...

“...I would like to put more photographs in my assignment...” (S4)

“...I would like to determine my own itinerary and stay at the place I want for the period of time I want. I would like to be the one to decide how much time I will be spending at a particular place instead of the instructor. For example, I would like to stay in Sofia not one day but 2 or 3. I would also like to spend less time in little towns...” (S81).

“...I would spend more time on my assignment and do a better job...” (S55).

“...It would have been more amusing if we had done the assignment in a group rather than individually. We could have done a better job if my friends and I had collaborated...” (S10).

“...I would spend more time on the assignment...” (S3).

“...I would read the GE user's guide in more detail...” (S41)

“...I would work on computers with faster Internet speeds...” (S46)

“...I would make more detailed observations on the intercity roads...” (S29)

The excerpts from the interviews carried out with the students reveal the students' ideas about what they would do differently if they were to be given the same assignment. The students said that the next time they prepared an assignment; they would allot more time to it, read the GE guide in more detail, study the routes between cities in more detail and set aside more space to visuals. Some of the students suggested that they would like to be the ones to decide on their travel routes the next time and some said that the assignment would be more beneficial if it could be done as a group.

The travel journal assessment scale indicated that some students spent more time than others on the assignment and that some did not take the assignment seriously. It was found that some students (e.g., S29, S55, S82) said nothing about places falling outside of the travel route, even though the instructions asked for such information. Others (e.g., S4, S10, S38, S46, S61, S74) set aside no space for visuals. Allowing students to set up their own itinerary is actually a better method. However, since having 84 students decide on the best alternative travel routes through 21 different European countries is of course a time-consuming and tedious task, preparing routes beforehand for the students was the method preferred by the instructor. The other reason that an instructor might choose this method of teaching is to take advantage of the instructor's own knowledge about

the various places so that a more accurate assessment could be made of the travel stories. Implementing the travel journal exercise as a group assignment may be a subject of experimentation in a similar study in the future.

DISCUSSION AND CONCLUSION

The students used the GE and other Internet-based resources to make their observations before writing out their travel journal assignment. They gathered information about a specific route through a European country from the GE, creating a text gleaned from the different geographic information (landforms, vegetation, waters, settlements, transportation culture) they learned in this way. The process of creating the travel journal, as expressed by Winchell and Elder (1992) facilitated their exploration of the locations they were examining. The students described the locations in their writing as if they had actually been to the different places and saw what there was there to see. As Brady (1999, 82) has said, this type of learning enhances student knowledge about geography as well as their writing skills.

The failure of GE to allow detailed observation of some locations (e.g., intercity routes, small towns) makes gathering information on these sites problematic. Such problem areas were generally the places that the students left out of their travel stories to a great extent. This shortcoming was an obstacle in the way of comprehensively describing the travel route. Major cities are available in the GE Program on a higher resolution and therefore more detailed information on these is more accessible. Getting information and making observations about routes between cities, however, is more difficult with GE. Because of this, instructors will see that students will tend to make more detailed descriptions of cities in their travel stories, compared to sites located between cities. Students will be more apt to keep their assignment confined to knowledge that they can easily reach and express. Their deficient skills in using the computer as well as the inexperience they might have, as Brady (1999) has pointed out, in interpreting maps further prevents them from including intercity routes in their travel journals.

The emergence of the GE program presents an indisputable opportunity for all teaching environments in every topic in the field of geography. With its storage of spatial data, its rich content and its interesting format, GE has proven to be a leading visual tool. Having university students prepare travel journals by making use of GE may provide the benefit of understanding the level of their skills and knowledge in geography. In writing travel stories, students may be both facilitated and entertained in their exploration of European countries. The exercise will challenge students to explore the depths of a country, even if only in the imagination. With the geographic information they gather from GE, students learn how to

organize and interpret this knowledge and thereby learn about the complexities of a particular country. The travel journal assignment gives students an opportunity to tackle and complete a complex job while also leaving them independent to work on their own. With some modifications, this type of assignment can be useful at lower academic levels as well.

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APPENDIX

Travel journal assignment instructions

This assignment asks you to make a personal imaginary trip along a specified route in a European country. For this, you will be using the Google Earth (GE) Program. GE is a powerful educational tool that will help you to collect information about your travel route. Review the GE user's guide in detail (<http://earth.google.com/>). This document tells you all that you can do with GE. When you download the GE Program onto your computer, your computer screen will turn into a window that opens onto any location in the country you are traveling in. There you will find high-resolution satellite images, photographs, altitudes, road and street tags, business listings and many other useful information.

Directions

1. You will be writing your travel journal about the travel route assigned to you using the "Places" segment on the Add panel. From the beginning of your trip to the end, put a "place tag" on the locations in "Places" you feel you want to describe and save the texts you have written (Using "File-Save-Save as"). The GE "Places" panel has an empty "My Places" folder where you can save what you write about the places you visit and describe. Every element in the "My Places" folder is saved for subsequent GE sessions. You can then travel around the places you have tagged. You can use this feature whenever you want to revisit, make adjustments or additions.
2. In writing your travel journal, you can use GE's Toolbar and the items on the "Layers" panel.
3. First look for a round-trip plane ticket to the country you will be traveling to. You will be leaving on December 15 and returning December 29. Your trip will take 2 weeks.
4. Please write a travel journal, describing your observations along the full route of the imaginary trip that you will be taking using GE. This travel journal will describe where you go day by day, the route you travel on each day, the modes of transportation you plan to take, the hotels you stay in, how long your trips take and the distances you travel.
5. Please report the characteristics of physical geography (landforms, vegetation, hydrology) and the features of human geography (settlements, transportation, culture) that you encounter along your route using GE. You must observe each image you see like a geographer and interpret this information as a geographer would.
6. Stay for 1 - 2 days at a facility in a city you find significant along the way. Observe the location using GE and write in your journal about how you spend the time there.
7. Using the appropriate links on transportation on the Layers panel, determine the travel route you will take between cities as well as the routes where you will be traveling making use of modes of local transportation. You must plan your transportation route according to the forms of transportation the local inhabitants use. You will be travelling by land, rail or sea. Do not use air travel unless absolutely necessary except for your travel to and from the country. Throughout the route, you may travel a maximum of 6 h a day.
You will find below some same Internet websites that you can make use of during your trip through Europe.
<http://www.eurolines.com> (for land travel in Europe)
<http://www.raileurope.com> (for railway transportation in Europe)
8. To be able to describe your route as a whole, you will also need to make observations about what you see between cities. In order to make your writing more realistic, try to keep your observations restricted to what you see around you as you travel in the vehicle you choose.
9. Besides your written descriptions, you should also allot some space in your travel journal for photographs that reflect the physical and human geography features along the route you traveled. For this, you can use the "Panoramio", "360 Cities", "Gigapan" and "Gigapxl" features on your Layers panel. You can save your photographs in the folder in the "Folders" segment of the "Add" panel. Please arrange the photographs you put in your journal in-between the related parts of the text.
10. Send the final version of your travel journal showing the results of your 4-week research (in KML file form) to my e-mail address.