Scientific Research and Essays Vol. 6(11), pp. 2274-2285, 4 June, 2011
Available online at http://www.academicjournals.org/SRE
ISSN 1992-2248 ©2011 Academic Journals

Full Length Research Paper

The effect of discussion supported geographical research trips on academic achievement

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Accepted 12 July, 2010

A geographical research trip was organised for the aim of determining the effects of discussion supported geographical research trips on students' academic achievements. A total of 44 geograhpy student teachers participated in this study which was done with a quasi-experimental model. A knowledge test about the tour region and its' close environment was applied to the participants before the trip. However, 19 questions were asked to the participants in this test and 4 of these questions were on individual data, while 15 of them examined students' academic knowledge. Geographical concepts (66.7%) which were determined through knowledge test were discussed during the trip, but 33.3% of them were not discussed. About 4 weeks after the trip, the same knowledge test was applied again. As such, quantitative data that were obtained through knowledge test were analysed with Kolmogorov-Smirnov test, dependent group t-test and Pearson product moment correlation coefficient, while the qualitative data were analysed with content analysis. Achievement level about the concepts in the knowledge test and, if available, complications and mistakes about concepts were determined. Results and suggestions were presented with connection to data and interpretations.

Key words: Geographical research trip, discussion supported trip, geoghraphy education.

INTRODUCTION

"The laboratory of the geographical research is the geographical environments' itself. Geographical facts can not be taught and learnt without travelling to different parts of the geographical earth" (Garipaaoğlu, 2001). The most important and effective way of using this laboratory is by geographical trip, of course (Doğanay, 1993, 2002; Alkis, 2008). However, theoretical knowledge turns into practice in geographical trips. Learning usually last long (Gök and Girgin, 2001; Girgin et al., 2003; Akbulut, 2004; Açikgöz, 2006; Demir, 2007; Özey and Demirci, 2008) and learned information is reinforced. As such memorizing is prevented, also. Methods like lecture, question-answer, problem solving, demonstration and assignment are used altogether in the implementation phase of the trip-observation method. Using these methods in a unit form, simplified teaching concepts to students (Garipağaoğlu, 2001).

In geographical trips, which are done within a plan and program (Izbirak, 1969; Çetin et al., 2006), there is a broad-base scientific discussion environment, in which students have oppotunities to ask questions and explain their opinions (Garipağaoğlu, 2001). Thus, geographical concepts in knowledge level are analysed with the support of practices, and as such, synthesis about concepts are done and evaluated (Kizilçaoğlu, 2003; Akbulut, 2004).

There are many activities in geoghraphical research trips. In these activities, a lot of characteristics of the geography are taught to the students directly or indirectly. One of them is the concept of geography, and 'discussion' is one of these activities that are applied to the aim of teaching geographical concepts.

In this study, concepts that were discussed during the trip and others that were not discussed were compared, and as a result, the data that were obtained during these processes were interpreted and concluded.

Aim

The aim of this study is to determine the effect of discussion supported geographical trips on academic

achievement. Also, determination of the statute of these activities in teaching geographical concepts and presentation of the usage and explanation of geographical concepts are aimed. In this context, the answers to the following questions are investigated:

1. Do the discussion supported geographical research trips have an influence on geography education?
2. Do the discussion supported geographical research trips have an influence on teaching concepts related with the trip's district and its closest environment?
3. Do the discussion supported geographical research trips cause differences in the geographical concepts of knowledge, comprehension, practice, analysis, synthesis and evaluation levels?

Importance

This research is important in terms of determining the effectiveness of discussion supported geographical research trips. Besides, contribution to the existing researches and provision of data to future researches are the other significances of this study.

Hypothesis

There is an assumption in the sufficiency of data collection tools and methods in collecting data that are appropriate to the aim of the study. Also, carefulness of the participant students in the process of research while they answer the knowledge test and similarity of their participation levels in activities is assumed as well.

Limitations

This study is restricted to a discussion supported geographical research trip which was ogranised by the researcher intended for data collection, with a knowledge test which was applied to the students before and after the geographical research trip and with 44 students who attended the geography education departments' 4th and 5th class levels.

METHODS

The research model

The data of this study which were done in quasi-experimental model were obtained through both qualitative and quantitative methods. A geographical knowledge assessment form that consisted of open ended questions was used in the collection of quantitative data, while qualitative data were obtained with content analysis method (Yildirim and Şimşek, 2006; Altunisik et al., 2007; Duman, 2008; Böke et al., 2009; Demir et al., 2009; Ekiz, 2009; Tanriöğen et al., 2009).

Universe and sample

The study's population comprised 4th (11 people) and 5th (33 people) grade students from the Geography Education Department, Ataturk Education Faculty, Marmara University in the 2008 - 2009 spring term. These student group (44 people) who joined a geographical reserach trip that was done in 29 - 30 April 2009, in Kirşehir, Nevşehir, Niğde, Aksaray and their close environment, formed the sample of this study.

Data collection

In this study, a research trip was organised and the geographical facts were discussed during this trip. Before and after the trip, a knowledge test which consisted of open-ended questions was applied, and the reliability and validity of it were determined by experts (Arslan et al., 2007: 208).

A total of 19 questions were asked to the participants in the knowledge test and 4 of them were individual, while 15 of them were academic questions. Gender, academic point average, birth place and the city that their parents live were determined with individual questions, while comprehension, practice, analysis, synthesis and evaluation, pyhsical, human and economic characteristics of the tour district and its' close environment were investigated with questions in the levels of knowledge.

About 66.7% of the geograhical concepts in the questions were discussed during the trip, while 33.3% of them were not discussed. These questions were applied before and nearly 4 weeks after the trip, to the sample group.

Before, during and after the geographical research trip, the following preperations and applications were done:

Tour district and duration were determined by the participant students before the trip. The chairman of the trip distributed the geographical characteristics of the trip route to the students for the aim of investigation and the students selected their issues. Written reports, which were prepared after determination time, were presented in the class environment supported with computer. Those presentations were copied and delivered to the students. As such, trip plan, activities, formal letters, etc., were prepared before the trip according to the participants' demands.

The researcher takes care of keeping together the students and ensures that they participate in activities. Geographical concepts which were needed for discussion towards the aim were especially discussed (Garipağaoğlu, 2001; Sönmez, 2009). Therotical knowledge, related to observations and practical information, was investigated and given. As such, participants had opportunities to communicate with the people who were living there.

After the trip, a general evaluation was done and the researcher asked students about activities which contain documents and materials that were obtained during the trip and reports about the trip.

Analyses of the data

Quantitative data that were obtained through pre and post tests were analysed with Kolmogorov-Smirnov test, dependent group t-test and Pearson product moment correlation coefficient, while qualitative data were analysed with content analyses (Yildirim, 2006; Altunisik et al., 2007).

RESULTS AND INTERPRETATIONS

In this study, about 52.3% of the participant students were male and 47.7% of them were female. In the university,

Table 1. The meaningless level of the research according to the dependent group t-test.

	Group	N	$\bar{X}$	Ss	Sd	t	p
All questions in knowledge test	Pre-test	44	52.4318	17.26725	43	10.124	0.000
	Post-test		77.0000	11.96312			
Undiscussed questions	Pre-test	44	47.2727	19.83228	43	5.460	0.000
	Post-test		62.4545	17.52003			
Discussed questions	Pre-test	44	55.0000	21.34871	43	1.226	0.000
	Post-test		84.2500	13.19818			

Table 2. Pre and post test point distance of discussed and undiscussed questions according to the gender.

	Gender	Pre-test point interval	Post-test point interval
Undiscussed questions	Female	0-70	20-80
	Male	20-96	36-100
Discussed questions	Female	25-100	55-100
	Male	0-100	55-100
The general average of all questions	Discussed	0-96	20-100
	Undiscussed	0-100	55-100

participant students' academic point avarage was 66. However, 4.5% of them were living in the trip's district, while 95.5% were living outside of it.

According to the result of the Kolmogorov-Smirnov test, (pre-test: z = 0.533; p = 0.939, post-test: z = 0.591), both pre and post test points range is consistent with normal distribution. The average of the points which were obtained from the knowledge test that was applied before the trip was 52 on a 100 point scale and this point increased to 77 in knowledge test which was applied nearly four weeks after the trip. There was 25.4318 points difference between pre and post tests. According to these results, in the dependent group t-test, there was a statistical significance in the 0.01 level towards post-test ($t_{(43)}$ = 10.124; p < 0.01). However, the relationship between the points of the two test was in a lower degree according to the Pearson product moment correlation coefficient (r = 0.441).

Some of the questions in the knowledge test were discussed during the trip and some of them were not discussed. The difference between the pre-test (47) and post-test (62) points of the questions which were not discussed during the trip was 15.1818, while that of the pre-test (55) and post-test (84) points that were discussed was 29.25. In this context, the statistical significance in t-test was higher in the questions that were discussed (Table 1).

In pre-test, which was applied before the trip, the lowest point was 12 and the highest point was 87, while in post-test, students' lowest point was 49 and their highest point was 100.

In this study, 2/3 of the questions in knowledge test were discussed during the trip, but 1/3 of them were not discussed. It was seen that, discussed concepts were comprehended better than others. While total points of discussed questions in pre-test were between 20 and 100, in post test, they were between 55 and 100. As such, these point ranges for the undiscussed questions were between 0 and 96 in pre-test and between 20 and 100 in post-test. As it was seen in Table 2, the basis points that are related with the discussed questions were high and the grade range was narrow. This result is important, because it indicates the effect of the discussion supported geographical research trips on academic achievement.

In this study, in the knowledge test which was used as pre-test, points of the male participants (54.3) were higher than female participants (78.4). In the undiscussed questions, pre-test points of female participants were high (78.4), while in the discussed questions, pre-test points of the male participants (50.9) were higher than females. Both in discussed and undiscussed questions', post-test points of males were higher than females. Besides, both in discussed and undiscussed concepts, when compared with pre-test points, increment rate of the male students' post-test points were higher than females (Table 3).

In pre and post tests, which were applied during the

Table 3. The average points of discussed and undiscussed questions related with gender and their total.

	Gender	Pre-test point	Post test point	Increment ratio (%)
Undiscussed questions	Female	43.3	54.1	24.9
	Male	50.9	70.1	37.7
Discussed questions	Female	57.8	80.1	38.6
	Male	52.4	88.0	67.9
The general average of all questions	Female	50.4	78.4	55.6
	Male	54.3	75.7	39.4

Table 4. Frequency and percentage of answers which were given to the question of "What is a playa?" by participants in pre and post test.

	Pre-test				Post-test			
	Correct	Deficient	Wrong	Unanswered	Correct	Deficient	Wrong	Unanswered
Number (person)	11	5	10	18	32	5	5	2
Percentage (%)	25.0	11.4	22.7	40.9	72.7	11.4	11.4	4.5

trip, knowledge, comprehension, practice, analyses, synthesis and evaluation level questions were asked with the aim of determining paticipants' comprehension levels in relation to geographical concepts. However, 10 of those 15 questions were discussed during the trip and 5 of them were not discussed.

In questions which examined the physical characteristics of tour district, the concepts of "playa, salt yards/saltern, interference cone, bandlands, maar, fairy chimney, katavothre, vulcanism and tufa" were discussed and in questions which examined the effects of physical characteristics on human characteristics, the concept of "underground city" was discussed.

In relation with the physical, human and economic characteristics of the tour district, issues as "southwester winds, vulcano cones, kirk ikindi rains, steppe vegetation and its' characteristics and the role of tourism wealth on settling" were examined, but were not discussed during the trip.

The data which were obtained through knowledge tests in relation to discussed and undiscussed concepts were applied to participants and these data were classified and interpreted in consistency with the research aim as follows.

Findings and interpretations related with discussed concepts during the research trip

1. The ratio of students who correctly answered the question about the "playa" increased with 191% in the post-test with respect to pre-test. In another meaning, the ratio of students who answered the question about the concept of playa correctly increased from 25 to 72.7%. When this concept was examined before the trip, it was seen that 40.9% of the sample group could not answer this question, while in post-test, this ratio decreased to 4.5%. The ratio of students who answered this question in a wrong way decreased by half in the post-test and half when compared with the pre-test results (Table 4).

The majority of students who answered the concept of playa in a wrong way used statements related with karstication in their expressions. These statements in pre-test are as follows:

"It came into being with the unity of katacothres; It is a karstic shape which is formed with melting process of chemical matters in karstic areas; It is a type of topography which develops in karstic areas; It is a land form which is seen in karstic areas; They are small and karstic in shapes; They are seen in areas where fluxing graywackes are dominant".

While in post-test, the statements are as follows:

"High, broad plain and karstic in shape". These wrong statements which highlight karstication represent that students use the concept of polje instead of playa and because of this, there is a concept complication.

2. Before the research trip, the meaning of concepts like "salt yards/saltern" was asked to participant students and it was seen that, 36.5% of them answered this question correctly. About 29.5% of the participants answered the same question inadequately and 25% of them did not answer it. This concept was discussed and evaluated in geographical research trip interaction with the sample group. After the trip, this concept was asked to participants again and this time, it was seen that, the ratio of correct answers increased by 81% in comparision with

Table 5. Frequency and percentage of answers which were given to the question of "What is salt yards/saltern? Explain it." by participants in pre and post test.

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	16	13	4	11	29	12	2	1
Percentage (%)	36.4	29.5	9.1	25.0	65.9	27.3	4.5	2.3

Table 6. Frequency and percentage of answers which were given to the question of "Give information about interference cone?" by participants in pre and post test.

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	18	3	3	20	32	3	4	5
Percentage (%)	40.9	6.8	6.8	45.5	72.7	6.8	9.1	11.4

Table 7. Frequency and percentage of answers which were given to the question of "Give information about characteristics of bandlands?" by participants in pre and post test

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	22	10	5	7	39	4	1	-
Percentage (%)	50.0	22.7	11.4	15.9	88.6	9.1	2.3	-

pre-test, and the inadequate answers decreased by 50% when the ratio of participants who did not answer decreased by 91% (Table 5).

Among the wrong answers in the tests, the statements like "spontaneously formed, salt production instutions which were gained from sea" were highlighted.

3. About 45.5% of the participants could not answer the question about "What is the meaning of the interference cone?" in pre-test. Only 40.9% of the participants answered this question correctly. In post-test, the ratio of the students which could not answer this question decreased to 11.4% and the ratio of the participansts who answered it correctly increased to 72.7%. It was assumed that, the increment in the ratio of wrong answers resulted from the participants' insufficiency towards explanation of their opinion, because it was seen that, participants who answered this question in a wrong way were successful in questions related with cone types (Table 6).

According to the findings in pre-test related with interference, cone participants' mistakes were as follows:

"They are the cones which are left over the normal cones; they are small volcanic cones which are parallel to the main volcanic cone; the shape is formed on the top of the mountains that are affected by vulcanism; the shape came up from more than one volcanic chimney".

and in post-test, participants continued to make mistakes with statements like:

"Small cones that are remaining from the big ones are formed after accumulation; cones are incompatible with cones in a line."

4. The question which examined the concept of bandlands is answered correctly by half of the participants in pre-test. In post-test, the ratio increased to 88.6%. There is no one who could not answer this question in post-test and the ratio of the participants who answered it wrongly decreased to 2.3% (Table 7).

In knowledge test which examined the concept of bandlands, it was taken to attention that the common mistake in paticipants' statements like wind and chemical melting were important factors in this formation. The wrong statements in pre-test were as follows:

"It is a geographical shape which was formed by wind; It is a wavy form which was developed after wind erosion; It is a land shape which was developed after configuration of the land after erosions; It is the last level of the erosion in topography."

The mistakes in post-test were as follows:

"They are wavy plains which are constructed of mesa plains and bed rock; after disruption of the karstic area through falls and rivers, there are deteriorations on the land. These areas are called bandlands."

5. The ratio of the participants who answered correctly,

Table 8. Frequency and percentage of answers which were given to the question of "Explain the concept of maar?" by participants in pre and post test.

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	17	11	14	2	30	4	10	-
Percentage (%)	38.6	25.1	31.8	4.5	68.2	9.1	22.7	-

Table 9. Frequency and percentage of answers which were given to the question of "Give information about fairy chinmeys?" by participants in pre and post test.

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	22	16	5	1	33	8	3	-
Percentage (%)	50.0	36.4	11.4	2.3	75.0	18.2	6.8	-

the question which examined the concept of "Maar" decreased in post test (68.2%) in comparision with pre-test (38.6%). The ratio of participants who could not answer this question or who had wrong answers decreased in pre-test, but this reduction is not the intended level. Among the discussed concepts in the trip, these concepts were answered in wrong ways in the highest level. It was thought that, detailed information which was given during the trip related with maar caused this situation, because the detailed information pieces that appeared were not mentioned in the pre-test. It was thought that, these details could prevent the expression of the main opinions (Table 8).

The most interesting ones of the participants' wrong answers in the pre-test were as follows:

"The other name of the volcanic lake is maar. We can give the Nemrut Lake as an example, because they are gaps which are formed after a collapse of a broad area. They were seen in karstic areas and we called the varicose condition of the volcanic vent as maar. The areas appeared like a swamp, but it is a vulcanism pit. Volcanic tuffs get out from there during the explosion and volcanic activity comes up to the earth's surface from the cracked places; After the inclosure of the chimney's vent on the volcanic mountain, there is a hollow and when it is filled with the rain and snow waters that construct a lake, it is called a maar. They are forms which are constructed with the cooldown of lavas after volcanism and it is formed with erosion in the volcanic area. It is the name of the vent of the volcanic cone after cracking and enlargement. They are hollows which exist in the earth's crust, especially in the bottom of the oceans. It is a lake which is formed in hollows in collapsed areas after volcanic activity and it develops after collapse of the cone and after volcanic activity of its' swamp with water. Broad caves are underground. A lake which develops w ith an island takes place within caldera in an earthenware pot that is bigger than crater." Wrong answers in the post-test are as follows:

"They are the caves that develop after collapse in volcanic areas; A cylinder hollow in a volcanic area or the vent of the volcanic block; The vent of the cylinderic volcano; It is the small ones of the crater; It is an artificial crater which is constructed on earth's crust by magma because of pressure; They are artificial craters; It is the cylinderic area which is on the vent of the volcanic lake; A form which develops with the dimple of the volcanic cone's vent; It is an unusual lake type which develops in lakes within the craters after development of a new crater with the volcanic explosion."

6. For the aim of getting information about construction and development of the fairy chimneys, the question of "Give information about fairy chimneys" was asked. To this question, 1/2 of the students in pre-test and 2/3 of the students in post-test gave correct answers. Increment of the correct answers in the pre-test was showing us, that students know the concept of fairy chimney very well, but in the post-test, 25% increase in the right answers, strenghten the belief towards geographical research trip and contribution of discussions during the trip. Although the concept of fairy chimney is known by participants, the tendency towards presenting wind and karstication as main factors to fairy chimney's construction increased the number of wrong and deficient answers in the knowledge test (Table 9).

In wrong answers in the pre-test, the statements like fairy chimneys develop in karstic areas and wind is effective in their development that is thus, highlighted frequently.

"It develops in karstik areas and starts its' construction with rivers split in a karstic plateau thoroughly. After that, wind erosion namely corrosion becomes a part of this

Table 10. Frequency and percentage of answers which were given to the question of "What is katavothre? Explain it?" by participants in pre and post test.

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	31	4	5	4	41	1	1	1
Percentage (%)	70.5	9.1	11.4	9.1	93.2	2.3	2.3	2.3

Table 11. Frequency and percentage of answers which were given to the question of "What is vulcanism?" by participants in pre and post test.

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	30	6	5	3	39	4	1	-
Percentage (%)	68.2	13.6	11.4	6.8	88.6	9.1	2.3	-

effort. Hard parts of those shapes stay like a cap on top of them and the result of karstic areas was splitted by wind, which was then shaped with wind corrosion. These karstic forms have a cap which prevents erosion; it is a form which is constructed through wind erosion; it is a land form which is constructed as a result of vulcanism; they develop as a result of the rocks which got out from the volcano cool down."

The examples of the mistakes in post-test were as follows:

"They are forms which were developed as a result of the erosion on the horizon that was constructed in karstic areas because of the internal forces. There is a hard horizon on the top of these geographical shapes apparently; As a result of the internal dynamics, these forms which have different hardness degrees were developed in karstic areas. They were developed after the erosion on horizons; It is an erosion activity which is on horizons that have different resistance levels, and it is formed in areas where the wind erosion is effective or where they are semiarid through wind and river."

7. The concept of "katavothre" took place among the discussed concepts and it had the highest level in the context of correctly answered questions in the pre and post tests. This concept answered 70.5% in pre-test and 93.2% in post-test correctly. The ratio of the students in post-test who answered it in a wrong way or could not answer it was in the lowest level (Table 10).

The ratio of the answers related with the concept of katavothre which was dicsussed during the trip, increased in the post-test as 22.7% in comparision with pre-test, but it was seen from participants' answers that, they have a concept complication between the concepts of katavothre and maar. The examples of the wrong answers in pre-test were as follows:

"It is land form which develops as a result of erosion; it is an erosion like "U" which constructs thorough rivers or seas and there are big gaps on the area because of the collapse on soft area; However, it is the smallest karstic erosion form."

In post-test, the mistakes were as follows:

"They are hollow areas like chimney or cone and surrounded with mountains."

8. The number of the participants who corectly answered the question of "What is vulcanism" increased in post-test and the number of wrong and deficient answers decreased. About 68.2% of the participants gave right answers to this question in pre-test and 88.6% of them answered it correctly in post-test. In pre-test, the ratio of the wrong answers was 11.4% and in post-test, it was 2.3%. Deficient answers retated with this question were 13.6% in pre-test and this ratio decrased to 9.1% in post-test. The ratio of the participants who could not answer this question decreased to 6.8% (Table 11).

The interesting wrong statements towards the question "what is vulcanism?" were as follows:

"Blocs looked like mountains, but they are not mountains in the context of their formation and underground activities of magma".

According to the findings, participants could not seperate the concepts of vulcanism and magma. They had deficient knowledge about orijenic and volcanic mountains and they used the concept of fracture instead of fault, but after observations and discussions in the research trip, it was seen that participants' mistakes and deficiencies decreased.

9. The ratio of the participants who answered the question of "What is tufa?" was low in pre-test (13.6%). Although in post-test, the ratio increased more than four times (56.8%), it was not the intended level, because this

Table 12. Frequency and percentage of answers which were given to the question of "What is tufa? Give information about its' effects on configuration of the earth surface" by participants in pre and post test.

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	6	9	14	15	25	9	8	2
Percentage (%)	13.6	20.5	31.8	34.1	56.8	20.5	18.2	4.5

Table 13. Frequency and percentage of answers which were given to the question of "Give information about underground cities and their characteristics?" by participants in pre and post test.

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	26	6	2	10	40	1	1	2
Percentage (%)	59.1	13.7	4.5	22.7	90.9	2.3	2.3	4.5

concept was used in other questions' answers in knowledge test and in a correct manner. Besides, during the discussion in the trip, almost no one used this concept wrongly. For example, in the expression process of the fairy chimney and bandland, the concept of tufa was used correctly and properly. Nevertheless, when they defined the tufa, it was seen that the number of questions which were answered in a wrong way and deficiently did not decrease to the intended level (Table 12).

Some of the mistakes related with the concept of tufa were as follows:

"They are elements which are constructed with the metamorphosis of the magmatic ashes; they are the formations which are resistant to erosion and dissociation in comparision to other forms in volcanic areas; it is a type of soft graywache in volcanic areas; it is the name of lavas which got out to lands' space; after lavas got out to the lands' space, they got cold and as such, tufas were constructed; it is a material which is constructed by lavas; lavas which develop as a result of volcanism get cold and as such, tufas are costructed; they are materials which remain after lavas have leakages as a result of volcanism; it is a fluid which get out from the volcano's chimney; a form which is seen in banlans' topography; a volcanic stone; it is the name of the volan chimney in volcanic mountains; it has volcanic shapes."

Wrong answers in post-test are as follows:

"Among the eruptives which got out from magma because of volcanic activities, tufas are durable formations to erosion and melting; they are durable forms which got out because of volcanism in volcanic areas; they are the lavas which are constructed after cooling down of lavas as a result of volcanism; they are materials which remain after lavas' are cooled down as a result of volcanism; they are remnants which are constructed after lavas' leakages as a result of volcanism; it is a chimney that was gotten out from the volcanic mountains by the magma; it is a material which is constructed by small cones; it is a volkanic debris."

10. The question which examined the effects of physical characteristics on human characteristics is "Give information about underground cities and their characteristics?" This question was answered by 59.1% of the participants correctly in the pre-test. In post-test, this ratio increased to 90.9%. The ratio of unanswered (22.7%), deficient (13.7%) and could not answered (4.5%) questions in pre-test decreased in post-test considerably (Table 13). When participants visited the underground city, the researcher asked them questions frequently, and the charasteristics of the city were discussed, so this situation affected the increment of correct answers in post-test.

Examples of wrong answers in both pre and post test, are as follows:

"There are collapses on majority of blocks after movements related with internal forces; there is a hard block on these collapses which is constructed in systems like cave and subway; they are used for the aim of defense in history and they offer tourism today; underground cities are constructed as a result of dropping waters to underground through fractures, especially in karstic areas because of the chemical erosion and after the enlargement of these fractures; they are caves where humans lived in long periods."

Findings and interpretations related with undiscussed concepts during the research trip

1. The ratio of the correct answers to the question "What are the geographical reasons of the southwest wind?" is

Table 14. Frequency and percentage of answers which were given to the question of "What are the reasons of the kabayel winds? Explain it." by participants in pre and post test.

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	3	-	7	34	4	2	26	12
Percentage (%)	6.8	-	15.9	77.3	9.1	4.5	59.1	27.3

Table 15. Frequency and percentage of answers which were given to the question "which of these (Hawai, Strato, Stromboli and Pele) belong to the III and IV periods in Turkey, Nemrut, Süphan, Ağri, Erciyes and Hasandağı volcano cones? Explain it." by participants in pre and post test.

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	4	5	5	30	12	4	10	18
Percentage (%)	9.1	11.4	11.4	68.2	27.3	9.1	22.7	40.9

lowest and the ratio of wrong answers is in the highest level for post-test. It was interesting that this question was answered in pre-test correctly by 6.8% of the participants and in post-test, the ratio was 9.1%. Besides, the increase of the deficient and wrong answers in post-test was important (Table 14).

The number of the questions which could not be answered decreased in post-test, but it caused the increase of the wrong answers, at the same time.

The concept of "southwest wind" could not be taught to participants in the desired level. It was thought that, participants' overlook the effects of the southwest wind which is effective on this result, because the term participants could not meet the effects of this wind.

Participants used wrong statements in pre-test related with southwest wind as follows:

"They are cold winds which blew from northwest and there are bountiful rains and storms. They develop with sudden frontal alterations."

and in post-test, the wrong answers were as follows:

"They are cold winds which blew from north east and they have refreshing effects; they are winds from the northern areas that blew at lenght and their effects are cold; they originate from frontal factors; they blew from cold areas to hot areas; they are black frost winds which blew from north; Northeaster are called "bakirsattiran" in Central Anatolia; its' real name is northeaster; it has refreshing effects; the northeaster blew from the north; this wind has refreshing effect in summer; they are hard winds which develop with sudden pressure alterations; they are seen in continental climate areas; they have refreshing effect because they blew in summer."

It was thought that, this negative table was based on the statement mistake between the concepts of "kabayel" and "karayel", because almost all the wrong answers contained the chacteristics of kabayel. Statements like: "They are cold winds which blew from northeast; there are bountiful rains and storms in winter; and they have refreshing effect in summer" are used frequently. Chacteristics of karayel which were mentioned in pre-test were repeated in post-test and this situation caused a concept error and as such, participants scrambled the concepts of kabayel and karayel.

2. The ratio of the correct answers to the question "which of these (Hawai, Strato, Stromboli and Pele) belong to the III and IV periods in Turkey, Nemrut, Süphan, Ağri, Erciyes and Hasandağı volcano cones? Explain it." is lower in pre-test (9.1%). Although this ratio increased in post-test, it was not the intended level. Questioning of the volcanic mountains outside the trip environment affected this situation so much. Besides, it was thought that, given statements which could be answers to the question, affected the increment of wrong and deficient answers. Otherwise, seeing the type of volcanic cone and comparing it with the existing ones could not be possible. So, these characteristics could not be discussed and as such, positive indicators decreased (Table 15).

When we examined the wrong and deficient questions, it was seen that, given concepts in the question (Hawai, Strato, Stromboli, Vulkano and Pele) were written without any process. Also, there were some mistakes like "volcanic cones are dead volcanic mountains. They are active volcanos in earth. Although there are many volcanoes in our country, Erciyes mountain is active."

3. The question which examined the climate factors in the trip area was "What are the reasons for the forty afternoon rains". In pre-test, 59.1% of the participants answered it correctly, while the ratio of students who could not answer this question was 20.5% and the ratio of deficient and wrong answers was 9.1 and 11.4%, respectively.

In post-test, the ratio of correct answers increased

Table 16. Frequency and percentage of answers which were given to the question of "What are the reasons of the kirk ikindi rains? Explain it." by participants in pre and post test

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	26	4	5	9	36	4	1	3
Percentage (%)	59.1	9.1	11.4	20.5	81.8	9.1	2.3	6.8

Table 17. Frequency and percentage of answers which were given to the question of "Give information about the step vegetation and characteristics of the soil from which these flora are placed?" by participants in pre and post test.

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	16	21	1	6	29	14	1	-
Percentage (%)	36.4	47.7	2.3	13.6	65.9	31.8	2.3	-

Table 18. Frequency and percentage of answers which were given to the question of "Explain the role of tourism wealth on settlings' development?" by participants in pre and post test.

	Pre-test				Post-test			
	Correct	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**	**Correct**	**Deficient**
Number (person)	37	5	-	2	42	2	-	-
Percentage (%)	84.1	11.4	-	4.5	95.5	4.5	-	-

(81.8%), while the ratio of deficient answers remained the same (9.1%) as pre-test, and the ratio of wrong (6.8%) and unanswered (6.8%) answers decreased, respectively. During the trip, these rains which have effects on district were not discussed, but participants had experience about these rains during the trip. It was thought that, those experiences had effects on the higher ratio in correct answers (Table 16).

Statements like "they are frontal rains; they are short-term downpour rains in continental climate and in summers" were among wrong answers in pre-test, whereas in post-test, the statement "It is a rain type which occurs in Aegean district in the afternoons" was used.

4. The question of "Give information about the step vegetation and characteristics of the soil in which these floras are placed?" was not discussed during the trip. The researcher was waiting to examine participants themselves, but the ratio of correct answers increased to 65.6% in post-test. Both in pre (47.7%) and post (31.8%) tests, the ratios of deficient answers were quite high. The basic reason for this situation is that paricipants' answers were only about the first section of this two-phased question (Table 17).

Among wrong answers in the tests, there were statements like "it is seen in wet and semi-arid climate areas; generally, podzolik soil is dominant in these areas".

5. Human and economic characteristics of the trip district were examined with the question of "Explain the role of tourism wealth on settlings' development?" The answer ratio to this question is highest both in pre and post tests and the ratio of the correct answers in pre-test was higher (with 80%) than that of the correct answers in post-test. This situation showed that, before the trip, this question was known by students very well. Although this issue was not discussed with participants during the trip, after the trip, wrong answers increased virtually to 11.4% and this situation indicated the contribution of the trip (Table 18).

Related with the discussed and undiscussed concepts in the trip, we can make the following comparisons for the afore-explained concepts.

Seemingly, 2/3 of the knowledge test was discussed with participants during the trip and 1/3 of them was not discussed. The ratio of the correct answers both for the discussed and undiscussed concepts increased in post-test, but the average of the ratio of the correct answers related with discussed concepts was higher than the undiscussed concepts.

About discussed concepts, in post-test, the ratio of the correct answers changed between 56.8 and 93.2%. However, this ratio changed for the undiscussed concepts between 9.1 and 95.5%.

The ratio of the correct answers related with the discussed geographical concepts increased in the pre- and post-test in order of 30, 32.3, 50, 53.8, 76.5, 77.3, 77.8, 81.3, 190.9 and 316.6%. About the undiscussed concepts, the ratio is as follows: 13.5, 33.3, 38.5, 81.3 and 200%.

The number of participants who had wrong answers

about the discussed concepts in pre-test decreased by 90% in post-test, while the number of participants who had wrong answers about the undiscussed concepts in pre-test decreased by 20% in post-test. In 40% of the concepts, the number did not change, but in another 40% of them, the number changed.

In 70% of the discussed concepts, the number of participants who had deficient answers in post-test decreased in comparision with pre-test, while in 30% of them, there were no changes. Besides, in 60% of the undiscussed concepts, the number of participants who had deficient answers in post-test decreased when compared with pre-test. However, in 20% of them there were no change and in 20% of them, this number increased.

Both related with the discussed and undiscussed concepts, the number of unanswered questions in pre-test decreased by 100% in post-test, but in post-test, the number of students who could not answer the undiscussed concepts was higher than the number of students who could not answer the discussed concepts.

CONCLUSION AND SUGGESTIONS

In this study, which was trying to determine the effect of the discussion supported geographical research trips on academic achievement, we reached the following results and suggestions from the findings.

Conclusion

The average point which was obtained from knowledge test and which was applied before the geograpgical research trip commenced was lower than the average point which was obtained from knowledge test and which was applied nearly four weeks after the trip.

It was determined that, concepts which were discussed during geographical research trip taught much better than the undiscussed concepts. The base point in the discussed questions was higher than the undiscussed questions. The interval between the highest and lowest points in post-test was narrower in the discussed concepts than the undiscussed concepts. According to the dependent group t-test, the statistical significance of discussed concepts was higher than the undiscussed concepts.

In pre-test of the discussed questions, female participants' points were higher than males, and in pre-test of the undiscussed questions, male participants' points were higher than females. Both in discussed and undiscussed questions, male participants' points were higher than female participants' points. Beside, both in the discussed and undiscussed questions, male participants' points were higher than that of the females, as regards the increment ratio of the points in post-test in comparison with pre-test.

Moreover, the number of participants who had deficient answers and no answers in pre-test, related with both discussed and undiscussed concepts, decreased in post-test.

SUGGESTIONS

The geographical research trips must be used in every level of education, but development and learning levels of the participant students must be considered and concepts which are desired for discussion must be determined before the trip. As such, activities in the trip must be constructed in relation to this.

Geographical research trips must be used by teachers frequently. Thus, student teachers must be encouraged to participate in these activities. These encouragements must be reinforced with active roles which are given to students by the head of the trip.

At first, the geography teacher must evaluate the physical, human and economic entities in close environmet while he/she teaches the geographical concepts.

The head of the trip must share the trip results with participants after the trip. When these evaluations are done, he/she must teach that they need to move towards the aims of the trip.

The results of the geographical research trips must be published in order for it to contribute to future researches.

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