

Full Length Research Paper

How do high-school students perceive the concept of 'map': A case study from Istanbul

Adem ÖZDER

Süleyman Şah University, Istanbul, Turkey.

Accepted 24 July, 2013

The main aim of this study is investigating metaphors developed by the students regarding the concept of 'map' at private institutions which provide them with specialized courses (Dershane). About 338 students in one of these private courses in Istanbul city center accepted to participate in the research within 2012 to 2013 academic year. The research data were obtained from the following statement of students: "Map is like, because....." Content Analysis Technique of Qualitative Research Method was used to analyze and interpret the collected data. According to outcome of the research, private courses to students produced 49 different and acceptable metaphors in relation with the concept of map. These metaphors were categorized under 10 different conceptual categories after being studied carefully based on their common features. The research findings revealed that most of the students perceive the maps as a piece of paper showing countries, directions, places, landforms, provinces, and regions while some of them put an important emphasis on how maps made and transferred to the 2D papers. However, some of the students' perspective indicated that they perceive the maps as helpful educational tool.

Key words: Map, geography teaching, geography education.

INTRODUCTION

Lexical meaning of the map is transmission of an area to a flat surface by using scale. Maps are the most functional and effective tools which serve as guide for people in increasing their awareness about the environment that they live in. Maps, one of the most fundamental tools of geography teaching, are defined as "neatly drawn geographic representations of the bird's-eye views of selected phenomena characteristic to the Earth's surface as a whole or a part of it" (Campbell 2001; GESP 1994; Lambert and Balderstone 2000; Ünlü et al., 2002; Şahin, 2003).

It is commonly accepted that, the fundamentals of the map were created in prehistoric times. The sign language was commonly used during those times. They formed maps on the rocks or ground by using sign language. In fact, who invented the first map is unknown, because the

originals were lost in time. Today, we can see the prehistoric era maps that is static such as wall, cave wall, rocks or the surface of pottery, leather, hides and bones are found on portable objects (Akkuş, 1995). The start of a new era, and the increasing geographical discoveries were positively influenced by global mapping.

"In general, all of the earth or the case of a section and features minimization by a certain ratio drawn on a plane or on the plane shown in the draft" (Ünlü et al., 2002:9; Şahin, 2003). Map reading and interpretation skills are one of the most important competencies both in the geography curriculum of primary and secondary schools and in social sciences as well (GESP, 1994; Incekara and Kantürk, 2010; McClure, 1992).

In the last few decades, significant social, political and economic developments have been seen in most

Table 1. Frequency and percentage of the students by gender.

Gender	Frequency (f)	Percentage (%)
Boys	161	47.6
Girls	177	52.4
Totals	338	100

countries, and reflected in educational programs in the form of inevitable reforms in content, teaching methods, textbooks, and teacher education (Hardwick and Holtgrieve 1996). In the standard based teaching programs which emerged in the wake of these developments, improving geographic skills of students are among the most emphasized issues in teaching program objectives, visions and missions (Geography Education Standards Project [GESP] 1994; Qualifications and Curriculum Authority [QCA] 2007; Royal Canadian Geographical Society [RCGS] 2001; Turkish Ministry of National Education [MEB] 2005).

Map skills allow geographers to answer the fundamental questions they ask as such skills help them to visualize and interpret processes and patterns in natural and human environments (Hardwick and Holtgrieve, 1996).

METHODOLOGY

The research was conducted using a content analysis method which is accepted as a qualitative research method with phenomenologic scientific pattern. The objective of content analysis is understanding the concepts and relationships that explain the obtained data. Especially, the information about the issues regarding; what is a map? How it can be defined? Benefits of using maps, metaphor studies and their contributions to teaching and learning were acquired by content analysis of the key publications including books and papers. The data acquired by interpretation and outline process of the survey within descriptive analysis were used and in this way, new themes and concepts were discovered. The fundamental process in content analysis is to classify the similar data under and umbrella concepts and themes and to organise and interpret them to provide the readers with better understanding (Yıldırım and Şimşek, 2003; Çelikten, 2006).

Keeping these objectives and aims, the study developed around the following research questions:

- (i) How do the students perceive the concept "map",
- (ii) Do they have some misconceptions of "map"?
- (iii) How teachers can use the perceptions of students on maps in their teaching process?

338 students enrolled in two private courses in Istanbul city center contributed to the study in 2012 to 2013 academic year. 177 out of 338 students were schoolgirls, 161 students were schoolboys (Table 1).

In order to investigate the perception of students about the "map" concept, students were asked to complete the following statement: "Map is like.....; because.....". A blank paper on which was written "Map is like.....; because....." was provided to the students. Students were asked to write their ideas by concentrating

on just one metaphor. The metaphors introduced by the students were organized and interpreted in five phase. These levels are: (1) The phase of coding, (2) Classification phase, (3) Category development phase, (4) The phase of validity and reliability, (5) The phase for transferring data to the computer. In this phase, a temporary list of metaphors created by the students taking part in the study was prepared in alphabetical order. The purpose was to figure out whether those metaphors were used noticeably by students or not all metaphors written on the questionnaire sheets were coded (for example: minimization ratio, a piece of paper, direction). The papers with no metaphors were excluded. 13 of the papers were eliminated after this process.

Every metaphor were included by one of the 10 categories by using metaphor analysis and content analysis techniques. Similar and common points with other metaphors were discovered. The target metaphors stated by students were controlled one after the other and ((1) The metaphor topic, (2) Their source (3) The connection between the topic and the source of the metaphor) were analyzed.

In this research, since the some papers did not have a metaphor, a few papers were left blank by the students, and also the relation between the content and the source of the metaphor in almost 5 papers were unrelated, totally 13 papers were eliminated. After the participants' answer sheets including weak structured metaphors were eliminated, 49 valid metaphors were discovered. In one example, a student provided: "Map is a like colors, because.....". It was considered invalid because the sentence is not complete and did not provide a complete understanding.

At this level, metaphors developed by the students investigated due to similar features that they have related to the concept of 'map'. Throughout this process, 49 different metaphors conceptualized by the students were examined. To that end, 10 different conceptual categories were discovered in relation with the particular themes based on the metaphors developed by the attendants related to the concept of 'map'.

FINDINGS

In this part of the study, findings from the metaphors on the 'map' concept produced by the private course students who took part in the research process were analyzed and interpreted in sub-titles considering the research questions. Which metaphors were used to explain private course students' perceptions towards the concept of 'map'?

Secondary school students developed 49 different valid mental images that belong to the concept of 'map'. These are; 'symbol, country, drawing, a piece of paper, image, helpful tool, tool, geographic condition, border, place, province, distance, guide, shape, surface area, visual, minimization rate, Turkey, a piece of land, geography, finding direction, encyclopedia, direction, region, shape, trip, place, guide, sketch, Earth, key, province, chart, geography, invent, material, continent, picture, minimization rate, scale, view, photo, visual, knowledge, mountainous place, mountain, physical appearance, province, land-form, table, discover, physical contact, space, object, geographic drawing, graph, political division, history, subject', The most preferred images for the concept of 'map' chosen by the students are a piece of paper (f=27), shape (f=4), border (f=10), minimization rate (f=24), place (f=44). As it is shown, a wide range of metaphors were

Table 2. The metaphors and related conceptual categories that private course students used about the concept of 'map'.

Categories	f	The most frequent metaphors
It is a picece of paper or an image which shows show the location of the countries in the world	64	A piece of paper (12), Country (11), Image (9), Tool (4), Border (4), Place (4).
It is a piece of paper whic is used to find the directions	62	A piece of paper (14), Direction (10), Tool (9), Place (8), Finding direction (4).
It is a tool informing us about the places	45	Tool (9), Place (9), Drawing (4), Picture (3), A piece of paper (3), Earth (2).
It is a tool informing us about the landforms of the Earth	36	Earth (7), A piece of paper (7), Tool (2), Drawing (2), Table (2), Discover (2).
It is a tool showing the location of provinces	36	Place (9), A piece of paper (8), Province (7), Tool (5).
It is the transfer of the Earth surface to a flat surface by using a scale	32	Minimization rate (13), Place (5), Earth (3), Border (2), Drawing (2),
It is a tool informing us about our surrounding places	24	Place (5), Picture(3), Drawing (3), Sketch (2), Country (2).
It is a tool which shows the location of a region	17	Region (4), A piece of paper (4), Minimization rate (2), Drawing (2),
It is an educational tool used in the courses	13	Finding direction (3), Tool (2), History (2),
It is a minimization of the Earth	9	Minimization rate (4), Encyclopedia (1), Table (1), Place (1), Earth (1), Province (1).

produced by the secondary school students for the 'map' concept.

The metaphors that the secondary school students used for the the concept of 'map' were investigated in 10 categories. Among these categories, the one which has the highest frequency of metaphors is "It is a piece of paper or an image which shows the location of the countries in the world". This category contains 64 metaphors such as country (11), drawing (4), a piece of paper (12), image (9), border (4), place (4), province (2). These metaphors were produced by 64 students. It is followed by this statement: "It is a piece of paper which is used to find the directions". This category includes 62 metaphors such as; direction (10), a piece of paper (14), finding direction (4), drawing(2). The third category is "It is a tool informing us about the places" containing 45 metaphors such as; minimization rate (2), place (9), drawing (4), shape (2), picture (3). In this category that says: "It is a tool informing about the landforms of the Earth", there are 36 metaphors like; Earth (7), country (1), tool (2), drawing (2), a piece of paper (7). The other categories are; "It is a tool showing the location of provinces" (similar to the fourth category it has 36

metaphors). The sixth category includes the following statement: "It is the transfer of the Earth surface to a flat surface by using a scale". This category includes 32 metaphors. The seventh category is "It is a tool informing us about our surrounding places" containing 24 metaphors. The other category is "It is a tool to show the location of a region". This category contains 17 metaphors. In the following category which says: "It is an educational tool used in the courses" category, there are 13 categories . The last category is "It is a minimization of the Earth". This category contains 9 metaphors. The metaphor categories those private courses students developed about the concept of 'map' were given in Table 2.

Conceptual categories

Category 1: It is a picece of paper or an image which shows the location of the countries in the world

When Table 2 was examined, it is seen that "It is a piece of paper or an image to show the location of the countries

Table 3: Valid metaphors developed by the students about the concept of 'map'.

Order	Metaphors	f	Order	Metaphors	f
1	Symbol	1	26	Material	2
2	Country	15	27	Continent	2
3	Drawing	19	28	Picture	7
4	A piece of paper	50	29	Surface area	2
5	Image	10	30	Visual	3
6	Helpful tool	1	31	Scale	4
7	Geographic condition	2	32	Photo	1
8	Border	10	33	Minimization rate	24
9	Tool	33	34	Turkey	1
10	Object	1	35	A piece of Land	2
11	Geography	5	36	Table	3
12	Finding direction	8	37	Landform	1
13	Encyclopedia	2	38	Knowledge	1
14	Direction	10	39	Mountain	2
15	Region	8	40	Physical appearance	1
16	Shape	6	41	Discover	3
17	Trip	1	42	Space	1
18	Place	44	43	Object	1
19	Guide	3	44	Geographic drawing	1
20	Sketch	5	45	Document	1
21	Earth	17	46	Plane	1
22	Key	1	47	History	2
23	Province	13	48	Physical contact	1
24	Chart	1	49	Political division	1
25	Invent	1	-	-	-

in the world" category had 64 metaphors developed by 64 students. The frequency of the metaphors in this category are as follows; symbol (1), country (11), drawing (4), a piece of paper (12), image (9), helpful tool (1), tool (4), geographic condition (1), border (4), place (4), province (2), distance (1), guide (1), shape (1), surface area (1), visual (1), minimization rate (1), Turkey (1), a piece of land (1), geography (1), finding direction (1), encyclopedia (1). The following were the examples written by the students in this category:

"Map is a picture because it show us countries location."
 "Map is a drawing because it represent us every region on the Earth."

Category 2: It is a piece of paper whic is used to find the directions

According to Table 3, there are 62 metaphors in "It is a piece of paper which is used to find the directions" category. These metaphors were brought forth by 62 students. When the distribution of metaphors in this category was examined, the most frequent ones were; direction (10), a piece of paper (14), finding direction (4),

tool (9), place (8), Earth (2). The examples given below were given by the students in this category:

"Map is like a direction because it helps us to finding direction."

"Map is like an image because it shows us location of a place."

Category 3: It is a tool informing us about the places

There are 45 metaphors in "It is a tool informing us about the places" category. These metaphors were produced by 45 students. When the distribution of metaphors in this category were examined, the ones which had the highest frequency distribution were tool (9), region (1), minimization rate (2), scale (1), place (9), drawing (4), country (1), shape(2), picture (3), sketch (2), a piece of paper (3), Earth (2). The following were the examples given by the students in this category:

"Map is like Earth because this tool informs about the places."

"Map is like a place because it shows the location of a region."

Category 4: It is a tool informing about the landforms of the Earth

According to Table 3, there were 36 metaphors in “It is a tool informing about the landforms of the Earth” category. When we examined the distribution of metaphors in this category, each student produced a metaphor, these were; Earth (7), country, tool (2), mountain (1), border (1), drawing (2), a piece of paper (7), table (2), discover (2), minimization rate (1). The statements made by the students of this category were:

“Map is like a mountain because it show the shape of geographic area.”

“Map is a region because it gives information about the rivers shape.”

Category 5: It is a tool showing the location of provinces

“It is a tool showing the location of provinces” category contains 36 metaphors. These metaphors were produced by 36 students. When we examined the distribution of metaphors in this category, the most frequent ones were seen as; place (9), tool (5), province (7), shape (1), a piece of paper (8), scale (1), object (1) Earth (1), geographic drawing (1), border (1). The statements made by the students of this category were:

“Map is like Earth because it shows the location of the provinces.”

“Map is a piece of paper because it gives information about the location of provinces.”

Category 6: It is the transfer of the Earth surface to a flat surface by using a scale

According to Table 3, there were 32 metaphors in “It is the transfer of the Earth surface to a flat surface by using a scale” category. These metaphors were developed by 32 students. When we examined the distribution of metaphors in this category, each student produced a metaphor which are as follows; border (2), Earth (3), drawing (2), minimization rate (13), place (5), graph (1), tool (1), guide (1), surface (1). The following were the statements made by students in this category:

“Map is a minimization rate, because it is a transfer of the Earth.”

“Map is a place, because it shows location of the countries on the paper.”

Category 7: It is a tool informing us about our surrounding places

When Table was examined, “It is a tool informing us

about our surrounding places” category had 24 metaphors produced by 24 students. The Frequency Distributions in this category are as follows; picture (3), political division (1), image (1), place (5), sketch (2), country (2), tool (1), drawing (3), document (1), material (1), border (1). The following were the examples given by students in this category:

“Map is a image because it show us about our surroundings.”

“Map is a place because it gives information about residential area..”

Category 8: It is a tool which shows the location of a region

According to Table 3, there were 17 metaphors in “It is a tool to show the location of a region” category. These metaphors were brought forth by 17 students. When the distribution of metaphors in this category was examined, the most frequent ones were; minimization rate (2), drawing (2), a piece of paper (4), region (4), a piece of land (1), discover (1), plane (1), place (1), scale (1). The following were the examples given by the students in this category:

“Map is a piece of paper, because it minimized drawings of any region.”

“Map is like minimization rate, because it shows location of the regions.”

Category 9: It is an educational tool used in the courses

There were 13 metaphors in “It is an educational tool used in the courses” category. These metaphors were produced by 13 students. When the distribution of metaphors in this category were examined, the most frequent ones were seen as; finding direction (3), a piece of paper (1), region (1), tool (2), history (2), subject (1), place (1), geography (1), scale (1). The following were the examples given by students in this category:

“Map is a tool, because we use this tool in geography courses.”

“Map is like history, because we can learn historic places.”

Category 10: It is a minimization of the Earth

“It is a minimization of the Earth” category contains 9 metaphors. These metaphors were produced by 9 students. When we examined the distribution of metaphors in this category, the most frequent ones were observed as; minimization rate (4), encyclopedia (1),

table (1), place (1), Earth (1), province (1). The statements made by the students of this category were:

“Map is an encyclopedia because it shows us the provinces of the Earth.”

“Map is like minimization rate because it gives information about the Earth.”

DISCUSSION AND CONCLUSION

Metaphors are one of the most important tools of teaching and learning and the teaching refers to delivering a certain body of knowledge to the learners by teachers, and in so doing we cannot avoid also projecting an image of the “meaning” of this information. In educational studies, metaphors can be used to explain the meaning of the words assisting to determine what the most important issues are. Teachers or students can improve their knowledge or skills by using metaphors and the classes, schedules, activities or educational materials can be arranged according to these kind of scientific findings.

The study is based on qualitative research methods to examine metaphors about ‘map’ which were produced by students attending at private courses. The metaphors have shown the approach of private course students to the concept of ‘map’ and thus their thoughts have been classified into several groups.

All metaphors are classified by their features. The research has pointed out some before mentioned ideas (as it has been illustrated in the research results great number of students have a good image about the concept of ‘map’. Based on those findings, (the majority of students) say that “Map is a helpful tool”. It shows us location of the places on the Earth. These kind of concepts show that students reflect their experiences to the metaphors. Private course students have given many different metaphor examples about the the concept of ‘map’.

Therefore, the metaphors developed by the students differ from the case, although they contain very strong perspective on the case. To compensate this situation, there must be many metaphors (Saban et al., 2006; Saban, 2009). Those are the factors that determine the metaphor of “map”; students’ experiments, interests of students and teachers, education level, environmental condition, courses are some of the determinative factors in teaching and learning of the negative or positive reflections of private course students about the term of ‘map’ concept may direct teachers in planning the lesson. Because the most of metaphors and categories indicate similar dimensions of the term of ‘map’, almost all of the students may have reflect similar learning approaches.

Based on this study, it is seen that “It is a piece of paper or an image which is used to show the location of the countries in the world” category had the highest

frequency among metaphors (f=64). This may reveal that private course students perceive the concept of ‘map’ as the Earth and a piece of paper. Another category “It is a piece of paper which is used to find the directions” follows the first category (f=62). This category contains direction and places. “It is a tool informing us about the places” with the frequency of 45 metaphors underlines that it is a tool providing information about places.

Another conceptual category stress the landforms. The students expressed this category perceive the maps as a tool showing landforms (f=36). The other category which is “It is a tool showing the location of provinces” (f = 36) put an emphasis on provinces. However, in the conceptual category “It is the transfer of the Earth surface to a flat surface by using a scale” (f=32) students pointed out the technical aspect of the maps that giving information about how the maps are made.

The other categories “It is a tool informing us about our surrounding places” (f=24) and “It is a tool to show the location of a region” (f=17) underlines that maps are the tools to depict close places and regions on earth. In the category which is “It is an educational tool used in the courses”, the importance given to being and educational tool (f=13). The last category is “It is a minimization of the Earth” with the frequency of 9 metaphors underlines how the earth minimized and transferred to 2D papers.

The research findings provide us with clues about how private course students perceive the ‘map’. Teachers may organize courses in accordance with student perceptions, metaphors and conceptual categories that have been stated in this paper while they are teaching about maps in general (Quale, 2002:453-457).

This study teaches us that teachers have a chance to produce and develop their own classroom agenda with the help of metaphors to explain their own roles and responsibilities for a better education. With this idea taken into consideration, metaphor studies should be conducted to develop new ideas and methods for teachers in their classes, preparing course documents, teaching programs, and textbooks in schools as well.

REFERENCES

- Akkuş A (1995). Harita bilgisi, Konya: Özeğitim Publications.
- Campbell J (2001). Map use & analysis. New York: McGraw-Hill.
- Çelikten M (2006). The metaphors related to culture and teacher used in the education system. Erciyes Univ. Soc. Sci. Inst. J. 21:269-283.
- GESP (1994). Geography education standards project, geography for life: national geography standards. Washington D.C.: National Geographic Society.
- Hardwick SW, Holtgrieve DG (1996). Geography for educators: standards, themes, and concepts, USA: Prentice-Hall.
- Incekara S, Kantürk G (2010). The conception of maps among theteacher candidates of social sciences and their approaches to using maps. Marmara Geogr. J. 21:240-257.
- McClure RW (1992). A conceptual model for map skills curriculum development based upon a cognitive field theory philosophy. Oklahoma State University (Unpublished PhD dissertation), Oklahoma.
- Quale A (2002). The role of metaphor in scientific epistemology: a

- constructivist perspective and consequences for science education. *Sci. Educ.* 11:443-457.
- Saban A (2009). Mental images of teacher candidates towards "student" concept. *Turk. Edu. Sci. J.* 7(2):281-326.
- Saban A, Koçbeker BN, Saban A (2006). Examining of teacher candidates' perceptions towards "teacher" concept through metaphor analysis. *Educ. Sci. Theory Pract.* 6(2):461-522.
- Ünlü M, Ucısık S, Ozey R (2002). Coğrafya eğitiminde haritaların önemi. *Marmara Geogr. J.* 5:9-25.
- Yıldırım A, Şimşek H (2003). *Qualitative research techniques in social sciences*, Seçkin Publications, Ankara.