Full Length Research Paper

The analysis of high school students' perceptions towards "environment" concept

Hüseyin Kaya*, Mücahit Coşkun and Fatih Aydın

Department of Geography Education, Faculty of Science and Literature, Baliklar Kayasi -78050, Karabük University, Karabük, Turkey.

This research was carried out to put forward high school students' metaphors towards "environment" concept. The study group of the research consisted of 136 students that attend Prof. Dr. Mümtaz Turhan Social Sciences High School in İstanbul Turkey in the second term of 2009/2010 academic year. The data of the research were gathered by completing "Environment is like… because …" statement. The analysis and interpretation of the data were done using the phenomenological science design and content analysis technique of qualitative research method. According to the findings of the research, high school students produced 60 valid metaphors towards "environment" concept. The metaphors mentioned were classified into seven conceptual categories (environment as the expression of pollution, beauty, life, space, importance, reflection and variation) in terms of their common features. The research results indicate that students produced more metaphors that emphasize the importance of environment followed by the metaphors that express reflection, space and beauty. In the suggestions section, it was emphasized that teachers should teach the concepts via metaphors and such applications should be carried out to different student groups, teachers, teacher candidates and parents.

Key words: Metaphor, environment, student, geography, environment education.

INTRODUCTION

Some of the definitions of metaphor are: a person who perceives the meaning of a concept or phenomenon and expresses them using similes; metaphor is a way of thinking and seeing (Morgan, 1988); it is a powerful mental tool used in a person's understanding and explanation of a high level abstract, complex and theoretical phenomenon (Saban, Koçbeker and Saban, 2006). Metaphor is not only a thinking tool, a way of grasping things and a verbal figure but also a figure of thinking as well (Lakoff and Johnson, 2005). Main functions of metaphors are getting, interpreting, transferring and the benefit from overcoming ambiguity of the metaphors (Erdem and Şatir, 2000).

Metaphors give opportunities for comparing two things, drawing attention to the similarities between two things and explaining one thing in terms of another. In any metaphoric relation, three main factors should exist. They are (1) subject of the metaphor (2) source of the metaphor (3) features of references from the source of metaphor (Saban, 2004). Recently "metaphors" that drew the attention of educators have become the subject of both national and international literature. Inbar (1996), Guerrero and Villamil (2002), Botha (2009), Alger (2009), Shaw et al. (2008), Forceville (2002), Saban (2004, 2008, 2009), Saban et al. (2006), Töremen and Döş (2009), Girmen (2007), Aydoğdu (2008), Arslan and Bayrakçi (2006), Öztürk (2007) and Cerit (2008) are some of the related researches. The researches put forth how the concepts or phenomena of "teacher", "student", "knowledge", "director", "inspector" or "culture" were expressed using metaphors in general. Below are the two studies prepared in the last two years.

Inbar (1996) completed a research of over 409 students and 254 teachers from 15 different schools. The participants were asked to produce metaphors of

---

*Corresponding author. E-mail: huseyinkaya@karabuk.edu.tr. Tel: 00905052342840, 009021243382200.

"student", "teacher", "school director" and "school" concepts. According to the findings of the research "flora, fauna, prisoner, lonely…" for the students, "leader, warrior, teacher…" for teachers, "machine, store, world in frames…", and "authoritative power, farmer…" for school directors were got. It is also understood that the metaphors do not show a meaningful difference according to gender. Guerrero and Villamil (2002) conducted a research where 22 teachers were told to produce metaphors towards how they perceive their roles in teaching as a job. The teachers produced a total of 28 metaphors. These metaphors were classified and analyzed in 9 categories. These categories were coded as: teacher as a leader, teacher as transferring knowledge, teacher as the agent of change, teacher as growing people, teacher as contemporary people, teacher providing tools, teacher as an artist, teacher as a repairman and teacher as a gymnastics educator. With this study, it was stated that metaphors were tools for reflecting ones inner thoughts. A study has not been done on high school students' metaphors about "environment" concept in geography recently. When this dimension is considered, the present study is noted for its importance for being the first.

The purpose of the study

The purpose of the study is to put forth high school students' perceptions towards environment concept through metaphors. In mind with this general purpose, the following questions were investigated:

1. Through which metaphors do the high school students explain their perceptions on "environment" concept?
2. Under which categories can high school students' metaphors related to "environment" concept be classified in terms of their common features?

METHOD

The design of the study

The qualitative research method with "phenomenological scientific design" was used in this research. Phenomenological design focuses on the phenomena that we know but do not have deep and detailed knowledge. Phenomenological design forms a suitable study ground for researches that deal on the phenomena which are not so distant from us and the ones that we could not exactly grasp their meanings (Yıldırım and Şimşek, 2006: 72).

Study group

The study group for the research consisted of 136 students that attend Prof. Dr. Mümtaz Turhan Social Sciences High School in İstanbul/Turkey during the second term of the 2009-2010 academic year. The distribution of frequency and percentage of the students according to gender was indicated in Table 1. As seen in Table 1, 51 (37.5%) of the students are females, while 85 (37.5%)

are males.

Data gathering phase

In order to determine the perception of high school students regarding the concept of "environment", each of the students was told to complete the statement: "Environment is like …, because …" on a sheet of paper. In the instructions part, students were asked to focus on just one metaphor and write down their opinions about it.

Saban (2009) stated that metaphors were taken as a working tool, "like" term is generally used to clearly associate the relation between "the subject of the metaphor" and "the source of the metaphor". He also stated that the word "because" were used to understand the participants' reasons for the use of their mental images. The students were given 20 min to write their metaphors related to "environment" concept. These compositions written by the students constituted the basic source of data for this research.

Analysis and the evaluation of the data

Content analysis technique was used for the evaluation of the gathered data in this research. The main purpose of content analysis was to use the concepts and relations in explaining the gathered datum. The summarized and interpreted data in descriptive analysis was investigated deeply and the concepts and themes that cannot be realized in the descriptive analysis were discovered after this analysis. The content analysis is a process where data which resembled each other in the framework of certain concepts and themes were put together to organize and evaluate them in a way that they can be understood by the reader (Yildirim and Şimşek, 2006: 227). The analysis and the evaluation of the metaphors the students developed took place in five phases.

1. Coding and clearing up
2. Collecting the metaphor samples
3. Category Development
3. Ensuring validity and reliance
4. Loading the data into the computer

At first, a temporary list of the metaphors produced by the students was formed.

According to the purpose of the research, the students' writings were checked to see if the metaphors were clearly expressed. The metaphor in every student's paper was coded. The papers in which any metaphors were not written were marked. Then the metaphors written by the students were revised one by one again and analyzed in terms of (1) the subject of the metaphor (2) the source of the metaphor and (3) the relation between the subject of the metaphor and the source of the metaphor. In this research, there were 3 empty papers, no metaphors in 5 papers, and no connection between the resembling metaphor and the correspondence image in 25 of the students' papers; a total of 33 papers were eliminated from the research.

The metaphors produced by the students were examined in terms of their common features towards "environment" concept and 60 metaphors were generated by the students. How every metaphor conceptualize "environment" phenomenon was examined. To do this, a total of 7 conceptual categories relating each metaphor with a particular theme according to "environment" concept were determined.

To ensure the reliability of the research, experts were consulted to know whether the metaphors in the seven conceptual categories represent the related category or not. In the comparison, agreeing and disagreeing numbers were determined and the reliability of the research was assessed using Miles and Huberman's (1994: 64) formula (Reliability= agreement/agreement + disagreement).

Table 1. The distribution of frequency and percentage of the students according to gender.

Gender	Frequency (f)	Percentage (%)
Female	51	37.5
Male	85	62.5
Total	136	100.0

In qualitative studies, if the harmony between the evaluation of the expert and the researcher is at 90% or above, it is accepted as reliable at an accepted level (Saban et al., 2006; Saban, 2008; 2009). 92% reliability level was obtained in this study. The consulted experts put 5 metaphors (building, music, picture, computer and sea) in a different category which was different from the researcher. Thus, Reliability was 60/60(60+5):0.92. After determining the 60 metaphors and developing 7 conceptual categories, the entire data were transferred to computer program. After this stage, the number of participants (f) and the percentage (%) reflecting metaphors and categories were calculated.

FINDINGS

The findings consisted of metaphors that the participants (students at Prof. Dr. Mümtaz Turhan Social Sciences High School) developed towards "environment" concept and are presented as tables and sub headings after interpreting and analyzing them according to the research questions.

1. Through which metaphors do high school students put forth their perceptions about "environment" concept?

The students developed 60 valid metaphors towards "environment" concept. 47 of the 60 metaphors were formed by only one student. The rest of the students metaphors that the participating students developed were between 2 and 10. Table 2 points out the based on their frequencies and percentages.

2. According to common features of metaphors that were formed by high school students, under which categories can these metaphors be classified?

The metaphors used by the students towards "environment" concept were categorized into seven. These are;

1) Environment as the expression of pollution,
2) Environment as the expression of beauty,
3) Environment as the expression of life,
4) Environment as the expression of space,
5) Environment as the expression of importance
6) Environment as the expression of reflection,
7) Environment as the expression of variation.

The categories of metaphors by the students about "environment" were shown in Table 3.

Conceptual categories

Category 1

Environment as the expression of pollution: The students in this category set up a relationship between environment and pollution. When Table 3 was examined this category consisted of 8 metaphors by 9 students. Some statements of some students in this category include:

"Environment is like a bucket because it accepts whatever you throw, it contains everything in it"
"Environment is like industry because when industry is mentioned, dirtiness and pollution come to mind. The pollutions spread over everywhere. In other words, the environment gets polluted."
"Environment is like pollution because when I look at the environment the first impression I get is pollution."
"Environment is like a rubbish bin because our environment is not different from a rubbish bin"

Category 2

Environment as the expression of beauty: When Table 3 was examined this category consisted of 6 metaphors by 16 students. The students of this category perceive the beauty dimension of environment. Some statements of some students in this category include:

"Environment is like a pearl because it has a worthless value."
"Environment is like green because when I consider environment, I remember tree, forest and the green things.
"Environment is like a forest because forests contain all beauties inside. Forests are the elements of environment as well."

Category 3

Environment as the expression of life: It was seen that this category related environment with life and consisted of 3 metaphors by 11 students. Some statements of

Table 2. Valid metaphors produced by students towards "environment" concept, their corresponding frequencies and percentages.

Order of metaphors	Name of the metaphor	Frequency (f)	Percentage (%)
1	Green	10	9.70
2	Human	7	6.79
3	Life	7	6.79
4	Tree	5	4.85
5	Mirror	4	3.88
6	Nature	4	3.88
7	House	4	3.88
8	Cytoplasm	3	2.91
9	Garden	2	1.94
10	World	2	1.94
11	Woman	2	1.94
12	Soil	2	1.94
13	Toilet	2	1.94
14	Life	2	1.94
15	Nature	2	1.94
16	Child	1	0.97
17	Rubbish	1	0.97
18	Rubbish bin	1	0.97
19	Sea	1	0.97
20	Mixture of colors	1	0.97
21	Mother	1	0.97
22	Heart of the world	1	0.97
23	Friend	1	0.97
24	Fauna	1	0.97
25	Rainbow	1	0.97
26	Sky	1	0.97
27	Dough	1	0.97
28	Weather	1	0.97
29	Family	1	0.97
30	Everything	1	0.97
31	Cell	1	0.97
32	Lung	1	0.97
33	Human body	1	0.97
34	Goodness	1	0.97
35	Computer	1	0.97
36	Pollution	1	0.97
37	Epigraph	1	0.97
38	Bucket	1	0.97
39	Dog	1	0.97
40	Blackboard	1	0.97
41	Lettuce	1	0.97
42	Mosaic	1	0.97
43	Music	1	0.97
44	Organ	1	0.97
45	Organelle	1	0.97
46	Forest	1	0.97
47	Home for rubbish	1	0.97
48	Picture	1	0.97
49	Gum	1	0.97
50	Industry	1	0.97

Table 2. Count'd.

51	Site	1	0.97
52	Building	1	0.97
53	dictionary	1	0.97
54	Indoor plants	1	0.97
55	Scale	1	0.97
56	Society	1	0.97
57	Pearl	1	0.97
58	Egg's crust	1	0.97
59	Frame	1	0.97
60	flower	1	0.97
	Total	103 (f)	100(%)

Table 3. The categories of metaphors by the students about "environment" concept.

Categories	Metaphors	Total frequency of metaphors	Number of metaphors
Environment as the expression of pollution	Rubbish bin (1),rubbish (1),pollution (1), home for rubbish (1),bucket (1), industry (1), toilet (2), blackboard (1)	9	8
Environment as the expression of beauty	Green(10), lettuce (1), forest (1) ,flower (1), pearl (1), woman (2)	16	6
Environment as the expression of life	Life (7), living (2), soil (2)	11	3
Environment as the expression of space	Soil (2), home (4), nature (4), world (2), sky (1), sea (1), fauna (1), site (1), landscape (2)	18	9
Environment as the expression of importance	Lung (1), heart of the world (1), every thing (1), weather (1), cell (1), organ (1), human body (1), cytoplasm (3), organelle (1), scale (1), tree (5), music (1), frame (1), egg's crust (1), building (1), mother (1), family (1), friend (1)	24	18
Environment as the expression of reflection	Mirror (4), human(7), goodness (1),dog (1), child (1), gum (1), indoor plant (1), dough (1), picture (1), society (1)	19	10
Environment as the expression of variation	Rainbow (1), mosaic (1), computer (1),mixture of colors (1), dictionary (1), epigraphy (1)	6	6
Total		103	60

some students in this category include:

"Environment is like life because it affects every part of ones life. One is born, to live, grow up and die in the environment."
"Environment is like life because we are living inside life. Geography tells us this life, it determines our way of life."
"Environment is like life because so many things are in the environment that we need for living."
"Environment is like life because everything I see is geography. The living things around us live together with us, develop and grow up."

Category 4

Environment as the expression of space: In this category

is formed by the students that relate the living place with environment. There are 9 metaphors by 18 students. Some statements of some students in this category include:

"Environment is like nature because the place where one live is the environment."
"Environment is like nature because everything is in nature when we look around."
"Environment is like the world because we are living in world. Environment is our place of living."

Category 5

Environment as the expression of importance: This

category is formed by the students who consider environment as significant for life. There are 18 metaphors by 24 students. Some statements of some students in this category include:

"Environment is like a scale because as the scale loses its balance in a weak touch so does the environment. We should keep it balanced."
"Environment is like a building. Environment is unitary as a building. Environment loses its sustainability when a material is off."
"Environment is like our lungs because if we breathe through our lungs, there is life on earth thanks to environment."
"Environment is like cell because just as cells form people, environment forms the world."
"Environment is like a family because it needs protection all the time."

Category 6

Environment as the expression of reflection: When Table 3 was examined this category consisted of 10 metaphors by 19 students. Some statements of some students in this category include:

"Environment is like a mirror. When you look at it you see your life and what you do on earth. Environment reflects everything that you do either good or bad."
"Environment is like a picture because it involves every kind of colors and shapes. The ones that reflect the environment may be interpreted differently."
"Environment is like a mirror because people determine and arrange their own environment. If a person is dirty, his environment is dirty; if a person is clean his environment is clean, too. "
"Environment is like an indoor plant because when you care, it becomes beautiful. If you disregard it, it perishes; if it is disregarded it turns to a non living place."

Category 7

Environment as the expression of variation: When Table 3 was examined; this category consisted of 6 metaphors by 6 students. Some statements of some students in this category included:

"Environment is like a mosaic because different species live in harmony together."
"Environment is like a dictionary because it contains everything inside."
"Environment is like an epigraph because we learn new things and develop ourselves."

DISCUSSION AND CONCLUSION

In light of the research, the following results were reached. In order to explain the concept of "environment" as a whole, so many metaphors are needed. High school students produced 60 metaphors towards "environment" concept. Students used a different range of metaphors as; "life, cytoplasm, rubbish, green" for "environment" concept. This condition shows that it is not possible to define "environment" concept with only one metaphor. The same situation can be seen in the research study of Öztürk's (2007) about "geography" concept. The research was used to determine the perceptions of 357 teacher candidates on which teacher taught geography as social studies; a science teacher or a primary school teacher at elementary level, using metaphors. 106 valid metaphors were gathered. As Yob (2003: 134) states basically, metaphor is not the case it mentions, it is only an image. If it were the case, metaphor would not be required.

Therefore, metaphor is different from the case and although it provides a very strong perspective related to the case, it is often less. To compensate for this situation, there must be a lot of metaphors. Starting from this point it is true that students using different metaphors of "environment" concept have a point of compensating for the whole. When the perceptions of high school students were categorized towards "environment" concept, the category that contains the most metaphors and frequencies was "Environment as the expression of importance". This indicates that students made similes, showing their care for the environment. As a result, the findings of this research show that high school students perceive "environment" as the expression of importance, reflection, spatial and beauty. The students produced so many metaphors based on the "environment" concept as being wide, partly complex and abstract. Yob (2003) stated that metaphors are strong means of comprehending and explaining high level abstract, complex or theoretical phenomena.

SUGGESTIONS

The following suggestions were developed according to the results of the research. Metaphors can be used as strong research tools in understanding, reflecting and explaining high school students' perceptions towards "environment" concept. In relation with this research, the findings may lead to reviewing of textbooks, curriculum and teaching process with a new understanding of "environment" concept.

The metaphors in the research may be used as sources for education or as metaphor lists or Likert type scale for researchers. In the teaching of complex or abstract concepts, choosing the right metaphors is significant. Semerci (2007) stated that educational metaphors have priority in explaining complex concepts and phenomena. Taking this into account, similar researches should be carried out for student groups at different types of schools (science high schools, Anatolian high Schools and vocational high schools), teacher candidates at

educational institutions for teachers, parents or teachers.

REFERENCES

Alger C (2009). Secondary Teachers' Conceptual Metaphors of Teaching and Learning: Changes over the Career Span. Teaching and Teacher Education: Inter. J. Res. Stud., 25(5): 743-751

Arslan F (2008). Metaforik tercihler bakımından Akif'i okuyabilmek. I.Uluslararası Mehmet Akif Sempozyumu, 259, Mehmet Akif Ersoy Üniversitesi.

Arslan MM, Bayrakçı M (2006). Metaforik düşünme ve öğrenme yaklaşımının eğitim-öğretim açısından incelenmesi. Millî Eğitim, 35(171): 100-108.

Cerit Y (2008). Öğretmen kavramı ile ilgili metaforlara ilişkin öğrenci, öğretmen ve yöneticilerin görüşleri. Türk Eğitim Bilimleri Dergisi, 6(4): 693-712.

Erdem F, Şatır Ç (2000). Farklı Örgütlerde Kültürel Yapının Metaforlarla Analizi, 8. Ulusal Yönetim ve Organizasyon Kongresi. pp. 25-27

Girmen P (2007). İlköğretim öğrencilerinin konuşma ve yazma sürecinde metaforlardan yararlanma durumları. Yayımlanmamış doktora tezi, Anadolu Üniversitesi, Eğitim Bilimleri Enstitüsü, Eskişehir.

Inbar D (1996). The free educational prison: metaphors and images. Educ. Res., 38(1): 77-92.

Lakoff G, Johnson M (2005). Metaforlar: Hayat, anlam ve dil (Çeviren: G.Y.Demir). İstanbul: Paradigma.

Miles MB, Huberman AM (1994). Qualitative data analysis. Thousand Oaks, CA: Sage.

Morgan G (1998). Yönetim ve örgüt teorilerinde metafor. İstanbul: Mess Yayınları.

Öztürk Ç (2007). Sosyal bilgiler, sınıf ve fen bilgisi öğretmen adaylarının "Coğrafya" kavramına yönelik metafor durumları. Ahi Evran Üniversitesi, Kırşehir Eğitim Fakültesi Dergisi, 8(2): 55-69.

Saban A (2004). Giriş düzeyindeki sınıf öğretmeni adaylarının "öğretmen" kavramına ilişkin ileri sürdükleri metaforlar. Türk Eğitim Bilimleri Dergisi, 2(2): 131-155.

Saban A, Koçbeker BN, Saban A (2006). Öğretmen adaylarının öğretmen kavramına ilişkin algılarının metafor analizi yoluyla incelenmesi. Kuram ve Uygulamada Eğitim Bilimleri (Edu. Sci. Theory Practice), 6(2): 461-522.

Saban A (2008). İlköğretim I. kademe öğretmen ve öğrencilerinin bilgi kavramına ilişkin sahip oldukları zihinsel imgeler. İlköğretim Online, 7(2): 421-455.

Saban A (2009). Öğretmen adaylarının öğrenci kavramına ilişkin sahip olduğu zihinsel imgeler. Türk Eğitim Bilimleri Dergisi, 7(2): 281-326.

Semerci Ç (2007). "Program Geliştirme" Kavramına İlişkin Metaforlarla Yeni İlköğretim Programlarına Farklı Bir Bakış, Cumhuriyet Üniversitesi, Sosyal Bilimler Dergisi, Cilt:31, nu:2, S.125-140.

Töremen F, Döş İ (2009). İlköğretim öğretmenlerinin müfettişlik kavramına ilişkin metaforik algıları. Kuram ve Uygulamada Eğitim Bilimleri (Educational Sciences: Theory & Practice), 9(4): 1973-2012.

Yob IM (2003). Thinking Constructively with Metaphors, Stud. Philosophy Educ., 22: 127-138.