

A CASE STUDY ON MIDDLE SCHOOL STUDENTS' VISIONS OF NATURE

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY
CEREN BAŞER

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
SCIENCE EDUCATION IN MATHEMATICS AND SCIENCE EDUCATION

FEBRUARY 2021

Approval of the thesis:

**A CASE STUDY ON MIDDLE SCHOOL STUDENTS'
VISIONS OF NATURE**

submitted by **CEREN BAŞER** in partial fulfillment of the requirements for the degree of **Master of Science in Science Education in Mathematics and Science Education, Middle East Technical University** by,

Prof. Dr. Halil Kalıpçılar
Dean, Graduate School of **Natural and Applied Sciences**

Prof. Dr. Erdiñ Çakırođlu
Head of the Department, **Math. And Sci. Edu.**

Assoc. Prof. Dr. Elvan Şahin
Supervisor, **Math. And Sci. Edu., METU**

Examining Committee Members:

Prof. Dr. Gaye Teksöz
Math. And Sci. Edu., METU

Assoc. Prof. Dr. Elvan Şahin
Math. And Sci. Edu., METU

Assoc. Prof. Dr. Sevgi Kırır
Primary Education, Hacettepe University

Date: 05.02.2021



I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name: Ceren Bařer

Signature :

ABSTRACT

A CASE STUDY ON MIDDLE SCHOOL STUDENTS' VISIONS OF NATURE

Başer, Ceren

Master of Science, Science Education in Mathematics and Science Education
Supervisor: Assoc.Prof. Dr. Elvan Şahin

February 2021, 283 pages

The purpose of the study is to investigate middle school students' visions of nature including images of nature, values of nature and images of human-nature relationship. Participants were selected from middle school students living in a city center in Turkey by using purposive sampling method. Using qualitative case study design, the data were obtained from the students through semi-structured interviews along with the supportive tools such as guided-imagery technique, draw-and-explain technique and card selection task in 2019-2020 Spring Semester. The data were analyzed by using content analysis method based on the umbrella-construct named visions of nature. The findings related to images of nature showed that the students associate nature with greenery and trees. The participants visualized nature as distanced from city life, away from crowd and technology. Considering the values of nature, the results showed that all of the students viewed nature as important. While majority of students provided some reasons reflecting indispensability of nature from an instrumental value, few of them mentioned intrinsic value of nature. Regarding the images of human-nature relationship, the students demonstrated Steward and Partner types indicating protection of nature and mutualistic interdependence between human and nature. Examining how the students view relationship of other people have with nature, it was found that they mostly depicted humans as showing Master and Apathy types.

Keywords: Visions of Nature, Human-Nature Relationship, Worldviews, Values,
Environmental Education



ÖZ

ORTAOKUL ÖĞRENCİLERİNİN DOĞA VİZYONLARI ÜZERİNE BİR VAKA ÇALIŞMASI

Başer, Ceren

Yüksek Lisans, Fen Bilimleri Eğitimi, Fen ve Matematik Alanları Eğitimi

Tez Yöneticisi: Doç. Dr. Elvan Şahin

Şubat 2021, 283 sayfa

Bu çalışmanın amacı ortaokul öğrencilerinin doğaya yönelik görüşleri, doğaya verdikleri değer ve nedenleri, insan ve doğa arasındaki ilişkiye yönelik görüşlerini kapsayacak şekilde doğa vizyonlarının incelenmesidir. Katılımcılar, şehir merkezinde yaşayan ortaokul öğrencilerinden amaçlı örneklem yöntemi kullanılarak seçilmiştir. Nitel vaka çalışması kullanılarak yapılan çalışmada veriler, yarı-yapılandırılmış görüşmelerin yanı sıra güdümlenmiş gerçeklik tekniği, çiz-ve-açıkla tekniği ve kart seçim aracı gibi destekleyici araçlarla 2019-2020 Bahar Dönemi'nde toplanmıştır. Veriler, 'Doğa Vizyonları' kuramsal çerçevesine dayanarak, içerik analizi yöntemi ile üç ana başlık altında analiz edilmiştir. Doğaya yönelik imajların incelendiği bulgularda öğrencilerin doğayı genellikle yeşillik alan ve ağaç ile ilişkilendirdikleri görülmüştür. Katılımcı öğrenciler doğayı akıllarında şehir yaşantısından, insan kalabalığından ve teknolojiden uzak bir yer olarak canlandırmışlardır. Öğrencilerin doğaya yönelik değerleri incelendiğinde bütün öğrencilerin doğayı önemli olarak algıladığı tespit edilmiştir. Öğrencilerin büyük çoğunluğu doğanın önemini nedenini araçsal değerler ile açıklarken, yalnızca bir kaç öğrenci doğanın önemini içsel değerlerden bahsederek sunmuştur. İnsan-doğa ilişkisine yönelik imajlar incelendiğinde ise öğrenciler, insan ve doğa arasında olması gereken ilişki ile ilgili kendi fikirlerini yansıtırken doğanın korunmasını vurgulayan Koruyucu (Steward) ve karşılıklı bağlılığı anlatan Ortak (Partner) tiplerini seçmişlerdir. Öte yandan, öğrencilerin diğer insanların doğa ile olan

ilişkinine nasıl baktıkları incelendiğinde, öğrencilerin diğer insanları Kontrolcü/Efendi (Master) ve Umursamaz (Apathy) tipleriyle betimledikleri ortaya çıkmıştır.

Anahtar Kelimeler: Doğa İmgeleri, İnsan-Doğa İlişkisi, Dünya Görüşleri, Değerler, Çevre Eğitimi





To My Family

ACKNOWLEDGEMENTS

I would like to thank all the people who motivated me and contributed to my thesis with their valuable opinions and psychological support during the process of my thesis. First and foremost, I would like to express my sincere gratitude to my supervisor Assoc. Prof. Dr. Elvan ŞAHİN, who always made me feel lucky to have a mentor like her, for her encouragements, and for guidance with her feedbacks and knowledge during this stressfull path. Whenever I feel overwhelmed with all the question marks in my mind and responsibilities, she reminded me that I am qualified enough to complete the thesis. I would like to thank my committee members Prof. Dr. Gaye TEKSÖZ, Assoc. Prof. Dr. Sevgi KINGİR for their valuable comments.

Secondly, I would like to thank my family who always believed in me during my academic career. I want to thank to my father, Mehmet Fatih BAŞER, who contributed to my thesis with his artistic work, supported me all the time; to my mother, Deniz BAŞER, who has encouraged me to be patient during this tense process; and especially, I want to thank to my sister, Dr. Ecem BAŞER who urge me forward to work on my dissertation without losing my faith and confidence on this rocky road.

I am grateful to my dearest friends who always supported me. Especially, I would like to thank to Seray BİRCAN who shares her experiences with me related to thesis writing process. Additionally, I would like to thank my homie, Elif KURT, for enduring my madness in home and make me calm. I also would like to thank my childhood friend, Gökçe DYSON, who always listens and makes pep talks to me when I feel down.

I cannot thank enough to my friend Deniz TURAN who followed the process of my thesis closely, motivated and allocated his time to me willingly in my every cry for help. The academic insights and experiences he shared with me, made me

approach my thesis from a realistic perspective. I am glad that this process made me realized that I had a valuable friend who I can call up when I have questions, to discuss and work with on academic subjects.

In addition, I am thankful to my office-mate and friend Rabia FİLİK-UYANIK, who shared her experiences and never refused to help me. I would like to extend my appreciation to my dear instructors Mehmet ŞEN and Sinem DEMİRCİ who always answered my questions and shared their academic experiences with me.

Finally, I owe more than thanks to my love, Tunahan KANBAK, who knows me better and cares me better than I do. Nobody but him could stand the tension and stress I went through in this process. With his endless patience, tolerance and love, I could be able to overcome all the negative thoughts, become cheerful and believe in myself. Knowing that he is always there for me made me strong, focus on my future goals and believe in achieving. I would never have been able to finish my thesis without his support, opinions, patience and love. I am a lucky woman to have this guy in my life.

TABLE OF CONTENTS

ABSTRACT	v
ÖZ.....	vii
ACKNOWLEDGEMENTS	x
TABLE OF CONTENTS	xii
LIST OF TABLES	xvii
LIST OF FIGURES.....	xviii
LIST OF ABBREVIATIONS	xx
CHAPTERS	
1 INTRODUCTION.....	1
1.1 Purpose of the Study and Research Questions.....	5
1.2 Significance of the Study	5
1.3 Definitions of the Important Terms	10
2 LITERATURE REVIEW	13
2.1 Historical Views on Visions of Nature	13
2.2 Conceptual Framework: Visions of Nature	19
2.2.1 Images of Nature	25
2.2.2 Values of Nature.....	32
2.2.3 Images of Human-Nature Relationship.....	37

2.3	Place of Visions of Nature in Environmental Education	47
2.4	Summary of Literature Review	48
3	METHOD	51
3.1	Research Design	51
3.2	Participants and Setting of the Study	55
3.2.1	Participants	55
3.2.2	Selection of Participants	59
3.2.3	Natural Setting of the Study	61
3.3	Data Collection	62
3.3.1	Data Collection Tools	62
3.3.2	Pilot Study	71
3.3.3	Data Collection Procedure	77
3.4	Data Analysis	79
3.4.1	Coding Rubric for ‘Nature Trip in Minds’ Task	83
3.4.2	Coding Rubric for Values of Nature	88
3.4.3	Coding Rubric for ‘Draw Humanity’s Relationship with Nature’ Task	89
3.4.4	Coding Rubric for ‘Card Selection’ Task	90
3.5	Trustworthiness of the Study	103
3.5.1	Credibility	104
3.5.2	Transferability	105
3.5.3	Dependability	106
3.5.4	Confirmability	108

3.6	Researcher's Position and Bias	108
3.7	Researcher's Motivation	109
3.8	Ethical Considerations of the Study.....	111
3.9	Limitations of the Study	112
3.10	Summary of Method	113
4	FINDINGS	117
4.1	Middle School Students' Images of Nature.....	117
4.1.1	Natural Setting.....	118
4.1.2	Species in Natural Setting	122
4.1.3	Activities and Materials.....	126
4.1.4	Feelings in Nature.....	130
4.2	Middle School Students' Values of Nature	132
4.2.1	Instrumental Values towards Nature	133
4.2.2	Neither Instrumental nor Intrinsic Values toward Nature	142
4.2.3	Intrinsic Values towards Nature	144
4.2.4	Summary of Values of Nature	146
4.3	Middle School Students' Images of Human-Nature Relationship.....	148
4.3.1	Stewards of Nature	149
4.3.2	Partners with Nature	159
4.3.3	Participants in Nature	166
4.3.4	Nature Distant Guardians	170
4.3.5	Summary of Students' Own Images of Human-Nature Relationship	173

4.4	Middle School Students' Views on Other People's Images of Human-Nature Relationship	176
4.4.1	One HNR Type: Humans as Master	177
4.4.2	Two HNR Types	182
4.4.3	Multiple HNR Types.....	200
4.4.4	Human-Nature Relationship as 'Boomerang'	204
4.4.5	Summary of the Views of Students regarding Humanity's Relationship with Nature.....	206
5	DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS	209
5.1	Middle School Students' Images of Nature	209
5.2	Middle School Students' Values of Nature	215
5.3	Middle School Students' Images of Human-Nature Relationship	217
5.3.1	Middle School Students' Own Images of Human-Nature Relationship	217
5.3.2	Middle School Students' Views on Other People's Images of Human-Nature Relationship	219
5.4	Interrelation between Three Components of Visions of Nature.....	222
5.5	Educational Implications.....	227
5.6	Suggestions for Further Studies	230
5.7	Summary of Discussion	233
6	REFERENCES	235
APPENDICES		
A.	Cards for Human-Nature Relationship Types	257
B.	Turkish Version of Semi-Structured Interview Protocol	261
C.	Permission from The Ethical Committee at METU	264

D.	Permission from The Ministry of National Education.....	265
E.	Turkish Summary / Türkçe Özet	266



LIST OF TABLES

TABLES

Table 3-1 Leisure Time Activities of the Participants	56
Table 3-2 Past Nature Experiences of the Participants	59
Table 3-3 HNR Types and Their Narratives	70
Table 3-4 Coding Rubric for ‘Nature Trip in Minds’ Task	86
Table 3-5 Coding Rubric of Values of Nature	88
Table 3-6 Coding Rubric for ‘Draw Humanity’s Relationship with Nature’ Task	91
Table 3-7 Coding Rubric for ‘Card Selection’ Task: Student’s own Ideas regarding Images of Human-Nature Relationship	94
Table 3-8 Coding Rubric for ‘Card Selection’ Task: Other People’s Images of Human-Nature Relationship	98
Table 3-9 Differences between HNR Typologies.....	101
Table 4-1 Overview of Results for “Natural Setting” Category	119
Table 4-2 Overview of Results for “Natural Species” Category	123
Table 4-3 Overview of Results about Types of Activities.....	127
Table 4-4 Overview of Results of Feeling to be in Nature	131
Table 4-5 Summary of Values of Nature	147
Table 4-6 Codes and Phrases of Stewards of Nature	158
Table 4-7 Codes and Phrases of Partner with Nature	166
Table 4-8 Codes and Phrases of Participants in Nature	170
Table 4-9 Codes and Phrases of Nature Distant Guardian.....	173
Table 4-10 Summary of the Students' Own Images of Relationship	173
Table 4-11 Phrases of Apathy toward Nature	191
Table 4-12 Phrases of Master over Nature	192
Table 4-13 Summary of the Views of Students Regarding Humanity’s Relationship with Nature.....	208

LIST OF FIGURES

FIGURES

Figure 3-1 Single-embedded Case Study Research Design adapted from Yin (2018, p. 84).....	53
Figure 3-2 Single-embedded case study model of current study	54
Figure 3-3 General Model of Data Collection Tools in accordance with Research Questions	63
Figure 3-4 Summary of the Data Collection Tools	64
Figure 3-5 Revisions of Master Typology (from left to right old version, new version)	75
Figure 3-6 Revisions of Partnership Typology (from left to right old version, new version).....	76
Figure 3-7 Revisions of Participant Typology (from left to right old version, new version).....	76
Figure 3-8 Summary of Method	115
Figure 4-1 Word Cloud for Natural Setting	118
Figure 4-2 Word Cloud of Species in Imaginary	122
Figure 4-3 Word Cloud for Feelings to be in Nature	130
Figure 4-4 Card of Stewardship Type	149
Figure 4-5 Equal Value of Human and Nature and their Symbiotic Relationship	159
Figure 4-6 Card of Partnership Type.....	160
Figure 4-7 Card of Participant Type.....	167
Figure 4-8 Card of Nature Distant Guardians	171
Figure 4-9 Card of Master Type	178
Figure 4-10 Beren's Drawing.....	179
Figure 4-11 Fatih's Drawing.....	180
Figure 4-12 Arda's Drawing	182
Figure 4-13 Card of Apathy	184
Figure 4-14 Deniz's Drawing.....	184

Figure 4-15 Elif's Drawing.....	186
Figure 4-16 Ecem's Drawing.....	187
Figure 4-17 Emre's Drawing.....	189
Figure 4-18 Funda's Drawing.....	193
Figure 4-19 Tunahan's Drawing.....	195
Figure 4-20 Ezgi's Drawing	196
Figure 4-21 Miray's Drawing.....	198
Figure 4-22 Mehmet's Drawing	199
Figure 4-23 Gamze's Drawing	201
Figure 5-1 Web of Discussion	234
Figure 6-1 Card of Apathy Type.....	257
Figure 6-2 Card of Participant Type	257
Figure 6-3 Card of Partner Type	258
Figure 6-4 Card of Steward Type	258
Figure 6-5 Card of Master Type	259
Figure 6-6 Card of Nature Distant Guardian Type	259
Figure 6-7 Card of User Type	260

LIST OF ABBREVIATIONS

ABBREVIATIONS

HNR: Human-Nature Relationship

EE: Environmental Education

ESD: Education for Sustainable Development

NDG: Nature Distant Guardians

WWF: World Wildlife Fund

MoNE: Ministry of National Education

CHAPTER 1

INTRODUCTION

‘One of the first conditions of happiness is that the link between man and nature shall not be broken.’

-Leo Tolstoy

Humankind, who were intertwined with nature physically, psychologically and evolutionarily, were began to detach from nature with the rapid advancements of technology and industrialization in today's world. Due to the human-made environment they constructed for themselves to achieve a more comfortable lifestyle, their connection with nature, their interest towards nature gradually decreased (Schultz, 2002). In the past few decades, the conclusive evidence came into view that our planet is raising concern with the interventions of humans, and consequently with the collapse of vital natural systems (World Wildlife Fund, 2020a). According to the report of 'The Living Planet 2020' of World Wildlife Fund (2020a), impacts of human beings on nature turned into catastrophic effects on several aspects of life such as deterioration of nature, reduction in wildlife population and risk of human health. In fact, one of the evidence that shows the deteriorated relationship between nature and human is the recent event that all the nations face: the COVID-19 pandemic. In a way, the pandemic of COVID-19 brought into light how the human health and the health of the Earth interrelated with each other (WWF, 2020a) and how humanity's relationship is important than it is considered. Eventhough this interrelation is apparent, throughout the years, with the wanton and reckless behaviors of humans towards the nature, natural imbalances, issues and problems such as acid rains, global warming, climate change, excessive air pollutions, epidemics and pandemics accelerated (Kahn & Kellert, 2002).

According to the Kaplan and Kaplan (2002), with the technological advancements, deterioration of natural ecosystems, accelerating population of humans, and in turn increasing demand for natural resources, urbanization and industrialization, it is realized that today's young people had a lack of opportunity to spend their time in natural environments and live in healthy natural systems. Children, aged between 8-11 and 12-15 spend their time with technological tools and media 6.6 and 9.3 hours per day, respectively, which prevents them from interact with nature (Edwards & Larson, 2020). In this regard, views of children towards and experiences with nature were affected by the altering life styles, rapid urbanization, technological advancements and natural problems (Louv, 2018).

With the alteration of suburbs and towns into cities, physical interaction of children with nature became limited, children were restricted to have contact with outdoor only going to school and shopping centers (Pyle, 2002). In the end, the relationship of children with nature distorted and they had a decrease or a lack of connection with the nature (Pointon, 2014). In fact, the situation of children becoming distant from nature is diagnosed and named by Louv (2018) as *Nature Deficit Disorder*. Children do not go outside, not experience the nature, not play in the nature and not become integrated with the nature like children did in the past. These situations should direct people to think on crucial questions and put a question mark in the minds. As Tolstoy said, if the relationship between man and nature is broken, will our happiness diminish? Is alteration in experience of nature and lack of relationship with nature a danger for the future generations or even for the sake of our planet or not? Or as stated by the van den Born (2007), will nature be forgotten due to the diminishing natural areas with the urbanization?

According to Pyle (2002), older generations and today's children started to have different understandings about the nature and open places in years. As Pyle (2002) indicated, when we look back on and compare the difference between generations' relationship with nature, one can realize that today's children do not perceive and experience the mother nature like the way their parents or ancestors did many decades ago (Louv, 2018). With the developing technological tools, gap between

generations related to perceived nature and relationship with it increased even much more than ever. Young people spend their most of time in front of the TV and playing video games from their smart phone or computers, rather doing any other activity (Strasburger et al., 2014). Therefore, there is raising concerns for future generations whether spending time with technology rather than going outside make them psychologically distanced from nature or not (Heerwagen & Orians, 2002). Additionally, Kellert (2002) states that experiences with nature directly, indirectly and in a symbolic way enhances cognitive, affective and evaluative development of middle school students. Since the modern societies do not provide opportunity to early adolescents any kind of experience with nature, there emerges a danger for the intellectual, cognitive and psychological development of the next generations. This situation should make people interrogate that ‘How do today’s children perceive nature when they are so detached from the nature because of developing technology, urbanization, destructed natural environments and additionally with some regulations due to COVID-19?’

Thus far, it is explained that there can be seen in humans an alienation and apathy towards relationship with nature. Yet, it is a crystal-clear fact that from the beginning of humanity, in order to meet their basic needs, to feel joy, to get whatever they want or to help nature, humankind interact with the nature closely (Atasoy & Ahi, 2019) and for the necessity of evolutionary process of humans. Concordantly to this, Wilson (1984) bring forward a daring assertion called as biophilia hypothesis defined like “a human dependence on nature that extends far beyond the simple issues of material and physical sustenance to encompass as well the human craving for aesthetic, intellectual, cognitive and even spiritual meaning and satisfaction” (Kellert & Wilson, 1993, p.20). In the definition, the biophilia is depicted by Wilson (1984, p.1) as “innate tendency to focus on life and life-like processes”. According to Kellert (2002), “the concept of biophilia and a related typology of weak inherent tendencies to value nature are used to elucidate the role of childhood experience of nature in personality formation and character development.” (p.117). In the light of these, if we consider that willing to establish close relationships with nature is an

innate more than an acquired characterization, disaffiliation towards nature and distorted relationship with nature can be harmful for both physical and mental health of children, their personality formation and character development towards the nature. To illustrate, several researches specified that even a little interaction with the nature such as being in the nature, observing natural habitats, keep in interaction with other livings, enjoying a scenery can raise the chance of healing both physically and psychologically, and increase the inner peace of the humans (Kahn et al., 2009; Pointon, 2014; van den Born et al., 2001). As today's children will be tomorrow's adults and they have to find solutions to future environmental problems, their views on human-nature relationship should be examined and should be emphasized more in the educational programs. Moreover, since today's children might affect from the lack of relationship with nature due to their lifestyles, one should question: 'What are the views of children towards the relationship between humankind and nature in such an everchanging world?' With obtained answers, students' views toward human-nature relationship might be strengthen and enhances can be implemented in educational programs to raise awareness toward the importance of humans' impacts on nature and their relationship with it.

In this regard, next generations are our only hope for carrying our world to the future and for finding solutions to the current problems that nature and humankind confront (National Wildlife Federation, 2015; Hughes et al., 2018). Therefore, before today's and next generations' children get caught to the *Nature Deficit Disorder*, human-nature relationship should be carefully considered and examined in the countries' education systems. Parallely, environmental education programs should take account how children view nature, give value to nature and how they establish relationship with the nature. In conclusion, to provide explanations and foresights to the questionmarks in the minds and to propose alternative ideas in regard to integrating students' views on nature and relationship with it in the educational context, visions of nature of middle school students was investigated in the present study under three main components which are images of nature, values of nature and images of human-nature relationship.

1.1 Purpose of the Study and Research Questions

The purpose of the present study was to investigate middle school students' visions of nature by examining three components namely, images of nature, value of nature and images of human-nature relationship (van den Born, 2008). Thus, the following research questions guided this study:

- 1.** What are the 'visions of nature' of middle school students?
 - 1.1.** How do middle school students view nature?
 - 1.2.** How do middle school students value on the nature?
 - 1.3.** What are the views of students related to images of relationship?
 - 1.3.1.** How do middle school students view their own images of human-nature relationship (HNR)?
 - 1.3.2.** How do middle school students view relationship of other people have with nature?

1.2 Significance of the Study

In the current contemporary societies, conservationists of nature believe that the protection of nature can be achieved with the support and involvement of citizens in a long-lasting period of time (Kloek et al., 2017). Therefore, in order to understand relationship between humans and nature and their views towards nature, social and natural sciences can enable researchers to reach meaningful outcomes and practices (Bennett et al., 2016; Kloek et al., 2017). In today's world, 'nature' and 'human-nature relationship' became one of the most frequently referred subjects for the countries' agenda and the education systems.

In respect to this, several researchers have asserted that notions of nature and human-nature relationship should be investigated and underlying ideologies related to relationship of humans with nature should be examined in the educational context (Palmer, 1998). Similarly, some authors, for example Wals (1994), assert the

importance of image of nature as the fundamental issue for environmental education research (Korfiatis, Stamaou, & Paraskevopoulos, 2004). Besides, studying on images of nature was seen as important because it is considered that images of nature has an impact of people's behaviors and readiness toward environmental issues (Korfiatis, Stamaou, & Paraskevopoulos, 2004). In this respect, examining and understanding the views and values of students toward nature and human-nature relationship might help educators to raise individuals who can shape a more sustainable world with their conscious behaviors. Additionally, since idea of raising children as empowered, responsible eco-citizens influence the education for sustainable development, understanding of children and their ideas on human-nature relationship come into prominence (Hallås & Heggen, 2018).

Regarding mentioned importances, in the field of environmental and sustainability education, there are some researches (i.e. Atasoy & Ahi, 2019; Li & Ernst, 2015; Merino et al., 2020; Nevers et al., 2006; Liu & Lin, 2014; Sadık et al., 2011) conducted in both international and national context (Ozsoy & Ahi, 2014). Yet, there is still a gap for human-nature relationship subject in educational context (Jordan & Kristjansson, 2017; Kalvaitis & Monhardt, 2012; Nevers et al., 2006) and further investigations on the topic were suggested for exploring the human-nature relationship (Muhar & Böck, 2018). The views of students toward nature and human-nature relationship still have been considered as one of the unexplored subject in environmental education from different point of views such as values, nature experiences (Ardoin et al., 2012; Hoover, 2020; Merino et al., 2020). The research related to the environmental education generally revolve around the subjects such as knowledge about environment, environmental literacy and attitudes toward environment (Ozsoy, 2012; Ozsoy & Ahi, 2014; Gunindi, 2012). As far as reviewed, limited number of studies (i.e. Pointon, 2014) were found specifically investigate the children's views toward nature, values of nature and views towards human-nature relationships at the same time. Although students are the most important elements in the environmental education, both their opinions toward environment (Ozsoy & Ahi,

2014) and their views toward nature and human-nature relationship has a little attention (Kalvaitis & Monhardt, 2012).

According to the Kalvaitis and Monhardt (2012), if the relationship between the children and nature or environment are understood better, ideas of students shed light on the preparation of environmental education curricula. In this way, environmental education become more beneficial for the needs of students such as being aware of the environmental issues, being knowledgeable to protect nature. Concordantly, in the research study conducted by Liu and Lin (2014), it was emphasized that in order to help the students think on, make them express their own worldviews and values regarding human-nature relationship, one should direct them to make decisions in a more ecological and holistic way (Colucci-Gray et al., 2006). As also supported by Ardoin, Clark and Kelsey (2012), there is an urgent need in the field of education for a research study on “worldviews and belief systems linked with individual identities” (p. 501), especially from the point of view of students (Liu & Lin, 2014). In this regard, examining all these components- in an umbrella-term, visions of nature- including their views toward nature, values of nature and images of human-nature relationship, which are also environmental worldviews (van den Born, 2007, 2008) made the present study significant.

Additionally, individual relationship of humans with nature were regarded as relevant to the goals, efforts, and policies of sustainable development (cited in Braito et al., 2017). Thus, in order to revise the educational curricula of countries for more compatible with the sustainable development goals and acquire a balanced and sustainable relationship of human and nature, one should comprehend the position of humankind in nature, natural processes and nature itself and making rational decisions for biophysical environment (Goldman et al., 2014). In fact, it has been discussed that most of the Education for Sustainable Development (ESD) approaches are regarded as unsuccessful to address place of humankind in relation to nature (Bonnett, 2007; Jordan & Kristjansson, 2017). Thus, there is explicit emphasis on need of investigating human-nature relationship for Education for Sustainable Development (ESD). Considering this, the present study may help to address on ESD

aspects in the literature from the educational context by examining how students' place humans in nature with the help of the HNR types.

Although it is stressed in the literature that younger age groups, like ages between 10-12, have a greater potential for fostering and getting information about relationship with nature (Ernst & Theimer, 2011), there were not found plenty of studies with the adolescents about their way of viewing nature and human-nature relationship (Pointon, 2014). Besides, the middle school students were chosen as participants because they are regarded as potential participants to represent relationship between humans and nature from a youth's point of view when compared to younger age groups (Li & Ernst, 2015).

Moreover, the present study has a valuable aspect which is that it provides different types of human-nature relationship on the basis of individual's own worldviews and identities (de Groot & van den Born, 2003). In the literature, there can be found different studies examine HNR types of humans; however, these studies were conducted generally with the adults. Little attention was given to the HNR types of students. In fact, when considering research done in Turkey context, there is a limited number of research that investigate the Turkish students' views about their types of HNR in the visions of nature construct. In fact, this conceptual framework provided generally by the Dutch researchers in the Western culture (van den Born et al., 2001; van den Born, 2007; van den Born, 2008; de Groot & de Groot, 2009; Kloek et al., 2017). According to Kloek et al. (2017) and Duong and van den Born (2019), researches are very limited which includes different ethnic groups, especially in Eastern societies. By considering this, examining the visions of nature of students in Turkey, which can be considered as non-Western country (Kloek et al., 2017), made the study valuable for literature.

Furthermore, since environmental problems, we face today, interlocked with people's relationship with the nature (Liefländer et al., 2013), it is important to know children's views towards human-nature relationship, because views of people's personal relation with nature can give insight about the way people behave to the

natural environment (Nisbet et al., 2009; Braitto et al., 2017). Until these years, cognitive elements were evaluated in the Environmental Education (EE) programs such as environmental knowledge, environmental awareness; however, in these years, affective components of relationship of nature with the children such as their preferences, point of views and perceptions come into prominence in the literature (Flowers et al., 2015; Liefländer et al., 2013). Even if it is challenging to examine students' views on nature and human-nature relationship, their views can be the explanatory variable of environmental behaviors (Braitto et al., 2017). In this way, both the countrys' education systems make their programs accordingly and raise citizens who behave environmentally and consonant with the goals of sustainability for the sake of whole planet and livings. In this respect, this study is worth to read because it investigates mainly affective components such as feelings. Besides, although environmental behaviours of students are not the scope of this study, findings emerged from the study might light the way to relate views on nature and types of HNR with the environmental behaviors.

To add, when research related to environmental education that is conducted with the children were examined, it can be seen that mostly preferred data collection tools were the interviews conducted with groups or individuals or observations. In the present study; however, different data collection techniques such as guided-imagery technique, draw-and-explain technique and showing different pictures and thought balloons were used along with the semi-structured interviews. In this way, it was aimed to make the participants more comfortable, engaged with the tasks and researcher tried to provide them a fun environment to share their opinions frankly and straight out. From this point of view, since these types of data collection tools, such as drawings and card selection tool help students to express themselves and ease their connection with the researcher (Ozsoy & Ahi, 2014), the present study enables a progressive point of view in respect to types of data collection tools.

Taking into account all of these assertions, this study has a significance regarding the visions of nature. The present study provides rich evidences by using multiple data collection tools while investigating views of middle school students towards (i)

images of nature, (ii) values of nature (iii) images of relationship between nature and humans.

1.3 Definitions of the Important Terms

Important terms that used in the present study can be found in the following.

Nature: Although it is still undecided how notion of nature should be defined in the environmental education context (Perrin, 2018), in this study, nature notion used and considered as an un-cultivated, un-artifactual landscapes such as forests, dunes, wetlands etc. (van den Born, 2008; van den Born & de Groot, 2009) that also include all the biotic and abiotic components.

Visions of nature: Visions of nature is defined as an umbrella construct that includes three components such as images of nature, values of nature and images of relationship (van den Born et al., 2001, p.66; van den Born, 2008). It is a framework that enable to learn students' real worldviews towards nature and human-nature relationship (van den Born et al., 2001, p.66).

Images of nature: Images of nature includes views of students towards what nature is in their opinion (van den Born, 2008). In the light of definition, in this study, images of nature of students were investigated under four categories: (a) natural setting, (b) species, (c) activities and materials used in the nature, (d) feelings toward nature.

Values of nature: The reasons why someone perceive nature as indispensable and important. These values were examined in three categories as instrumental values, intrinsic values and neither instrumental nor intrinsic values (van den Born, 2008).

Instrumental values: Value attributed to nature by considering its functions and usage for humans (van den Born, 2007).

Intrinsic values: Own value of nature irrespective of its functions for humans (van den Born, 2008; van den Born , 2007).

Human-Nature Relationship (HNR): It is an umbrella term, which includes abstract worldviews, values, beliefs, attitudes and perceptions of humans' relationship with nature (Braitto et al., 2017).

Images of relationship (HNR types/typologies): It is a view people hold about their appropriate relationship with nature (van den Born et al., 2001, p.66; van den Born, 2008, p. 87). In other words, it is the "view of nature and the position of humans in relation to this" (van den Born, 2007, p.12). In the present study, this notion can interchangeably be used with the human-nature relationship typology (HNR types) stated by the Braitto et al., (2017). According to Zweers (1989) (as cited in van den Born, 2008), types of HNR are the way of perceiving and comprehending the situation of real life. HNR types are the classifications of environmental worldviews about how people view relationship between nature and humans (van den Born, 2008). In this study seven HNR types were used which are Master, Steward, Partner, Participant, User, Apathy and Nature Distant Guardian (Braitto et al., 2017; van den Born & de Groot, 2009; van den Born, 2008). These seven types are selected from two different articles in order to create more inclusive and detailed frame. While the first four types (Master, Steward, Partner and Participant) are taken mostly from the articles of van den Born and de Groot (2009), the last three types (User, Apathy, Nature Distant Guardian) were taken from the article of Braitto et al. (2017). The explanations of HNR types are blended from three different articles (Braitto et al., 2017 ; Li & Ernst, 2015; van den Born & de Groot, 2009; van den Born et al., 2001). These explanations are given below. People who have the type of:

- *Master*, think that they stand above nature. In their opinion, humans can get everything they want from nature with technological developments and money for their own profit. In this way, they solve the problems (Braitto et al., 2017; van den Born & de Groot, 2009).
- *Steward*, think that they are responsible to protect nature. They owe responsibility to God, future generations, or other livings. They think that nature is entrusted to them. In their opinion, every action they have, as human beings, has an impact on nature. People can sometimes become a threat to

nature, and technology should be used to minimize them (Braitto et al., 2017; van den Born & de Groot, 2009).

- *Partner*, think that people and nature have equal value. To them, people benefit nature and nature benefits people. Technology should be used where both people and nature will benefit (Braitto et al., 2017; van den Born & de Groot, 2009).
- *Participant*, think that they are part of nature. They have a physical and emotional connection with nature. In their opinion, they do not have the right to use technology to make changes in nature (Braitto et al., 2017; van den Born & de Groot, 2009).
- *User*, think that they have the right to get every product and service from nature (Braitto et al., 2017; van den Born & de Groot, 2009). They think nature provides their needs. They have the right to use technology to improve the quality of their needs that nature offers us. They look out for the natural resources without the profit.
- *Apathy*, think that nature has no place in their life. They do not need nature to survive. They do not think their behavior has any effect on nature. They do not care the welfare of nature. In their opinion, there is no need to give importance to the nature (Braitto et al., 2017; van den Born & de Groot, 2009).
- *Nature Distant Guardian (NDG)*, think that they can protect nature without commune with nature. They can be a part of nature without leaving city life (Braitto et al., 2017; van den Born & de Groot, 2009).

CHAPTER 2

LITERATURE REVIEW

This chapter provides a review of the empirical literature studied on the views regarding nature and human-nature relationship within the visions of nature framework. First, historical views and theories developed through the years, which helps to explain visions of nature of the students are presented. Then, conceptual framework, which is ‘visions of nature’, is explained with the supporting literature. Three main components of visions of nature, which are images of nature, values of nature and images of relationship, are represented in detail by including studies with public and students separately.

2.1 Historical Views on Visions of Nature

Several researchers (Alerby, 2000; Bonnett & Williams, 1998; Kellert, 1985; Kellert, 1996; Pointon, 2014) have pointed out the importance of nature and the human-nature relationship in the past fifty years and literature used different terms with similar constructs of notions. The used terms in the literature can be encountered in studies interchangeably (Schultz, 2002), such as human-nature relationship and images of relationship; conceptions of nature and understanding of nature. These terms were used and studied in different fields such as ethics (or philosophy), psychology, biology, and education and the definitions toward nature and the humans’ relationship with it varied with the worldviews, cultural differences, ethical point of views, as well as with the effect of religion throughout the history (van den Born, 2007).

Considering the framework of the present study, the ‘visions of nature’ is interdisciplinary framework that includes environmental philosophy, environmental psychology and environmental sociology (van den Born, 2007). The definitions and

operationalizations of human-nature relationship has been affected from the attitudes, values, beliefs and perceptions of philosophers (Flint et al., 2013). Therefore, the historical views about attitudes, beliefs, theories and frameworks regarding humans' views towards relationship with nature are worth mentioning to understand the framework of the present study, namely 'visions of nature'.

From the philosophical aspect, 'values' of people about where they place nature come into prominence (Schultz, 2002). To be clearer, according to Schultz (2002) philosophical point of view interrogates whether the nature has an economic value, aesthetic value or religious value; whether people have a responsibility toward nature or not and 'to what extent people are part of nature' (p.64). With a different perspective, Bordeu (2004) defines ethics (or philosophy) as a discipline that deals with how humans should behave. Parallely, but with a specific focus, definition of environmental ethic is addressed with the values of nature and how it is significant from the point of view of people and their experiences (van den Born, 2007). Besides, it is described as a part of applied ethics that investigate the moral basis of responsibility of humans towards nature (Bordeu, 2004).

When briefly examined views of how humans should be related with nature, there can be found different perspectives of philosophers such as Plato's, Aristotle's and Descartes'; the approaches of religions and conferences related to sustainability. To illustrate, while Plato thought that the nature consist of an illusion, Aristotle brought forward that nature has a purpose which exist for serving the mankind for their beneficial (Bordeu, 2004).

When considering the religious beliefs, mankind's relationship with nature mentioned differently. While in the Christian views of the relationship of humans with nature, human is seen as the dominion over nature and the God created nature for humans to subdue it. In the Koran, humans were related with nature as the stewards of it. Besides, in the Koran, it is stated that the responsibility to protect nature is given to the humans (Bordeu, 2004).

Apart from the bibles, beliefs such as Buddhism consider that humankind should be live in harmony with nature and thinks that humans are interdependent with nature. In 1973, the term ‘deep ecology’ was introduced by philosopher Arne Ness as an idea that humans are part of the nature, nature has intrinsic value and it exists irrespective of its utility of people (Bordeu, 2004). Sustainable development is also mentioned by the ethics and emphasized the concerns for effect of humans’ impact on nature for the future generations. To summarize, in philosophy, thinkers placed the humans’ relationship with nature ranging from anthropocentrism to biocentrism (Bordeu, 2004).

When examining values of nature from biological perspective, Kellert and Wilson’s (1993) ‘hypothesis of biophilia’ asserts that humans are innately have a predisposition to connect with nature and other livings (Liefländer et al., 2013). Biophilia hypothesis, in a word, hereditary affiliation of humans toward all other livings (Kellert & Wilson, 1993). Thus, views and perceptions towards nature and humans relationship with it can be defined as affective connection (Kals et al., 1999). Kellert (1993), in fact, considered the biophilia hypothesis from the sociological point of view by stating that the humans’ dependence on nature is not just based on biological base, but also it has an effect on the people’s cognitive, evaluative and affective development.

Parallely, according to Leopold (1949), humans should think about the importance of nature and they should realize our dependence on nature. In Leopold’s opinion, people and nature should live in harmony and humans should learn respect to nature (Schultz, 2002). He outlined these views as *land ethic*. On the other hand, although Kellert and Wilson (1993) emphasized the biophilia hypothesis and believed that the affiliation of humans toward other living things, they stated that this is not a proven theory and there still exist discussion related to idea of biophilia from the different fields such as biology, anthropology, psychology. Besides, eventhough there are different levels of innate affiliation toward nature, it is mostly emphasized that children should interact with nature with different ways to be friend with nature (van den Born, 2007).

Given all of these aspects, van den Born (2007) considers the biophilia as the nature-friendliness, which has the love and affection towards the nature as stated first in the book of Fromm (1973). If it is considered that the biophilia hypothesis is empirically supported, then the love of children toward nature will not extinguish due to the rapid urbanizations and city life styles that children grow up in the future generations (van den Born, 2007). Although this study did not focus on whether the biophilia hypothesis is supported and internalized by the children who live in a city, it can be discussed by considering the findings whether they have affiliation toward nature, connected with nature or not even though the participant students were living in the city center. Moreover, another term called '*environmental identity*' refers 'to what extent someone experiences him- or herself as a part of nature and to what extent nature is important for his- or her self perception' (Liefländer et al., 2013, p. 371).

When looked evolutionary history, it can be inferred that it is important to learn relationship between humans and nature because desire to interact with nature is innately exists in humankind (Nisbet et al., 2009). In this regard, it is non-negligible the need of learning views toward nature and humans' relationship with nature.

In addition, sociological view interrogates how values shared among people (Schultz, 2002). Specific to the subject, this perspective focuses on the values of people they attributed to nature and human-nature relationship. With the increasing development of industrialization and urbanization, people become separated from the nature (Dopko et al., 2019; Soga et al., 2018). Especially, children living in the cities are generally being isolated from the outside world and cannot interact with nature (Louv, 2018; Rios & Menezes, 2017). This situation has a way long back in the history.

Before 1970s, with the industrial developments and urbanization, industrialized societies began to support the idea of '*DSP (Dominant Social Paradigm)*' (Goldman et al., 2014). '*DSP (Dominant Social Paradigm)*' perspective can be defined as a worldview that consists three aspects such as policy, economy and technology and it positioned the humankind as superior over other livings (Tarrant, 2009). One of the

dominant paradigm that directs both local and global regulations was the '*Ecosystem Services (ES)*'. It is defined as benefits of humans receive from the ecosystem directly or indirectly (Flint et al., 2013, p.209). Similar to '*DSP*' perspective, ES approach place the humans separate from the nature and nature as a storage of goods to be served for humanity.

Nevertheless, in years and with regulations in the countries, dominant paradigm perspective become open to criticism and challenged with the Dunlap et al.'s (2000) '*New Environmental Paradigm (NEP)*' perspective which is defined as a worldview that see the humans as a part of nature, not the humans as dominator over nature (Goldman et al., 2014). As a result, environmental movement turned the scope from anthropocentric view to the more altruistic and ecocentric view. In other words, in the history of Western cultures, views on the human-nature relationship has changed from mastery over nature to the stewardship, which is also directed by the religious, political or ethical considerations (Flint et al., 2013) like stated beforehand. In fact, since '*NEP*' approach supported the idea that humans as a part of nature, ecological sustainability -that is introduced in the World Conservation Strategy (IUCN- UNEP- WWF, 1980) and is defined as stance of humankind with nature in a respectful manner (IUCN/UNEP/WWF,1991)-, come into prominence. NEP scale was designed by Dunlap et al. (2000) to explore the fundamental views of humans on the nature and their relationship with it. This scale shows the level of anthropocentricity like in the types of HNR range from Master to Participants (van den Berg, 1999) as in the present study.

Although it can be related with the visions of nature framework, views of human-nature relationship were poorly presented such that only three of the subscales (balance of nature, limits to growth and humans over nature) of NEP correspond completely with the worldviews related to human-nature relationship types (de Groot et al., 2011; van den Born, 2007). Balance of nature, limits to growth and humans over nature can be considered as reflecting the Master type as used in the present study (van den Born, 2007), these types can be categorized as caretaker, manager-engineer and technocrat-adventurer respectively, as stated in the work of de Groot

(1992). On the other hand, NEP scale is lack of point of view of intrinsic value and do not focus on affective aspects (de Groot et al., 2011; van den Born, 2007). Since aforementioned gaps are not encountered in the 'Visions of Nature', this study adopted it as a framework by van den Born et al. (2001), van den Born (2007, 2008) and Braitto et al. (2017) for additional HNR types.

In addition to the philosophical and sociological views related to the human-nature relations, psychological view examines the relationship between the human and nature from the 'individual' aspect (Schultz, 2002), not from the societal or the ethical aspects like aforementioned. More specifically nature and humans' relationship with it often mentioned in environmental psychology as 'affective' domain, by incorporating individuals' knowledge, belief, actions, experiences from the cognitive and behavioral aspects (Ernst & Theimer, 2011). Schultz (2002) used the 'inclusions with nature' for a broad overview of human-nature relationship, which comprises of affective (caring), cognitive (connectedness) and behavioral (commitment) (Ernst & Theimer, 2011). Researches in this field support the idea that very tiny interaction with the nature- for instance looking from window to a beautiful natural scene- can increase the well-being of humans, promote healing and reduce unfavorable feelings, stress (Kahn et al., 2009). Since the present study investigates the views of students toward nature and human-nature relationship individually, in this regard this study and the psychological view might have similar qualities.

As can be seen from the previous studies, human-nature relationship and nature concepts can be mentioned under different disciplines, like philosophical, sociological and psychological perspectives. While some of the researchers (i.e. Kellert, 1993) characterized the human-nature relationship perspectives with the values, some of them are mentioned them as worldviews (i.e. Dunlap et al., 2000; van den Born, 2008), and some of the philosophers (i.e. Zweers, 2000; Bordeu, 2004) named it as attitudes. Given these premises, it can be seen that terms and types related to HNR concept can be seen as having some overlaps in the literature (Flint et al., 2013).

To conclude, from the literature, ‘Visions of Nature’ was chosen as the framework for this study as it focuses on three different aspects at once such as views toward nature, values of nature and its reasons and the human-nature relationship. Besides, these notions are help to explore views of nature of students, since these are overlapping and unseparable notions in its nature (Flint et al., 2013). With this kind of comprehensive concept, the present study can shed light on the questions in the literature regarding the human-nature relationship from the perspectives of tomorrow’s adults.

2.2 Conceptual Framework: Visions of Nature

‘Visions of Nature’ is an umbrella-term that includes three main components such as images of nature, values of nature and images of human-nature relationship (van den Born et al., 2001). ‘Image’ is reflected as a complex term, incorporating both representational and cognitive components (Korfiatis et al., 2004). Some researchers (Bujis, 2009; Bujis et al., 2009; Hunka et al., 2009; Li & Ernst, 2015; Liu & Lin, 2014) used worldviews, visions, icons for representing the nature (Korfiatis et al., 2004). In this study framework of ‘Visions of Nature’ was used proposed by van den Born and colleagues (2001, 2007, 2008).

‘Visions of Nature’ notion has a wide range topic that constitutes of three layers and has several studies related to it. According to van den Born et al. (2001), theory of nature can be considered as the first layer of the subject of visions of nature, which is also considered as the highest abstract concepts. In other words, the first layer of visions of nature subject is related to ethics and philosophy; which is also categorized under the environmental philosophy recently that includes eco-feminism, rights-of-nature theory (van den Born et al., 2001). Second layer of the visions of nature is considered as the ‘social construction of nature’ (van den Born et al., 2001, p.66) that include policies of leaders regarding nature, plans of nature conservation organizations and farmer unions. Lastly, third layer is related to the real worldviews of people from public, who are not the specialists on the nature and nature theories.

In the present study, the third layer of visions of nature, which focuses on the real worldviews of people who are not specialist, was investigated by studying with the middle school students in Turkey. The views of the students were examined in a general sense, rather focusing on specific subjects such as views on natural parks, forests. All in all, 'visions of nature' construct was used as a framework by considering its three components and definitions of the van den Born et al. (2001), van den Born (2008) and Braitto et al. (2017). Studies about the framework 'visions of nature' were mostly encountered in the Dutch literature, since the Visions-of-nature concept was pioneered by Dutch researchers such as van den Born et al. (2001). These studies conducted with the 'visions of nature' construct were reported in the following to provide insight for the present study.

van den Born et al. (2001) were conducted a study with the 200 lay people in Netherlands, by using the mixed methodology. They investigated the real worldviews of the public related to the nature, relationship with nature and values attributed to it under the visions of nature umbrella concept. Questionnaire were distributed to the public to examine their images of nature, values of nature and the images of relationship of public quantitatively and eight people among the participants were selected to conduct open interviews to investigate people's experiences in nature during their childhood. For the results of images of nature element, it can be stated that people categorized the nature as more or less natural things. According to the factor analysis, views toward nature were categorized under six images such as arcadian nature, wild nature, penetrative nature, domesticated nature, utility nature and the rain forest. When considering their values of nature, mostly emphasized values that indicates the importance of nature were found as value for human health, intrinsic value and value for future generations. Lastly, according to the results of human-nature relationship images, majority of the participants stated the humans as part of nature and therefore they have responsibility to protect it which is regarded as anthropocentric images and matched generally with the Stewardship type. Additionally, from the qualitative result of the study, two types of past experiences in nature was presented as admiration of nature and utilitarian

view toward nature. While in the former one, enjoying from voices of birds, touching living things were included; in the latter one people emphasized the functions of nature in their experiences such as going to picnic, going to forest to picking up fruits, recreation. They discussed that although Western culture is considered as superior over the nature and harm nature whatever they want, there can be developed a new biophilia for Dutch people which acknowledges the intrinsic value of nature, where there are viewed different types of nature and types by public. Besides, they supported that the more sophisticated research designs to make the results more definite and comparable for different cultures. For this reason, the present study was conducted to examine the visions of nature in Turkish culture.

de Groot and van den Born (2003) carried out a survey with the 172 Dutch people who lives in a small town in Netherlands. People were asked to distinguish types of nature and explain levels of naturalness, to share the images of relationship with nature and which type of relationship they feel close. Additionally the preference of landscapes of lay people were detected in the study. As in the previous study of van den Born et al. (2001), types of nature were detected as arcadian, elementary, penetrative nature and a swamp with the help of the factor analysis. These types of nature were ranked by participants according to their levels of naturalness as real nature, somewhat nature, not nature. In the study, it was found that Dutch culture overwhelmingly adhered to the image of 'Man as responsible for nature', in contrast to overall assertions related to image of man as the 'Master over Nature.' In addition, like stated in the van den Born et al. (2001), the new biophilia which is the merging of two images which are Man as Participants and Responsible for Nature were detected also in the study of de Groot and van den Born (2003).

van den Born (2008), similarly, conducted a study that deals with the visions of nature of lay people in the Netherlands. In the study, qualitative method was applied to 31 Dutch people whose ages were ranged between 40-55 and who were not the professionals on the environment. van den Born (2008) used the open and semi-structured interviews. While the images of nature were investigated, open interviews were applied, values of nature and the images of relationship was investigated with

the help of the semi-structured interviews. For the images of nature, ten photos were shown to the participants by the researcher and participants were asked to order these photos by considering its degree of naturalness. For the values of nature, respondents were asked explicitly whether they find nature as important or not and the reasons behind their choice was examined as instrumental and intrinsic values. Besides, the definition of intrinsic value was asked to the respondents. Lastly, reactions of participants were examined for each of the images of relationship which are master, steward, partner and participant types. Participants were asked to choose one of the visualized schemas of images of relationship that they feel close to their own idea and also how other people's images of relationship might be. The findings revealed that Dutch participants have the idea related to images of nature as 'the more cultivated, the less nature is' (van den Born, 2008, p.92). While they see the garden, cities and cultivated area as less nature; they see the forests, coasts as the real nature. Additionally, nature is seen as a space that provides tranquility. Moreover, values of nature is resulted that the people view nature as indispensable and the reason behind it categorized under instrumental values (i.e. for breathe, for health), intrinsic value (i.e. space of animals and plants) and neither intrinsic nor instrumental values such as beauty of nature. When it is wanted to define intrinsic value and tell how they view it, people were categorized under four groups who are the supporters of intrinsic value, people who are support intrinsic value but at the same time emphasized the needs of people and functions of nature for humans, people who are not supporting intrinsic value and see the nature only for their enjoyment and lastly, the ones who see the value as humans' concept and did not recognize its existence. When considering the images of relationship, people did not choose the master type, rather they stated a type that mix of steward and participant and they did not find the equality of humans and nature as realistic. Additionally, when people were asked to choose the other people's images of relationship; they chose master over nature type.

Hunka, De Groot and Biela (2009) conducted the visions of nature construct in the Polish culture. Similar to van den Born et al., (2001), mixed method was used to explore Polish people's views on images of nature, values attached to the nature and

their views on images of relationship. Differently from the previous visions of nature researches, to explore the images of nature, the short descriptions were provided that includes phrases like city park, birds in the fields, pigeons on the town square, Tatra Mountains and so on. The degree of naturalness and the human influence were tried to be detected. According to the results of image of nature, it is seen that the respondents have a wide range of perception of nature, and different from the view of 'the more cultivated, the less nature is' stated in the van den Born (2008, p.92), rather there is seen an overlap in the degree of naturalness and the human influences. In a word, although there is an average impact of human on the nature, landscapes can still have the high degree of naturalness. In addition, values of nature of Polish people were investigated and the reasons behind why they see nature as important were explored. To examine values of people, 7-point scale was employed and people are expected to ranked the given values (nature is important for: future generations, health, relaxation, own sake, aesthetic reasons, wildlife, recreation and tourism, medicine and technology, agriculture, Earth and mankind history, scientific research) from very important to not important at all. The value of the future generations and health were the highest ranked reasons for seen nature as important, with following the intrinsic value and relaxation value after these. However, in the interviews, mostly emphasized reason was found as the aesthetic and recreational values. To investigate the images of relationship Polish people attached were examined both with the survey and interviews, as did in the values of nature. According to the factor analysis, four factors were classified as the conquerors of the nature, stewards of the nature, participants in nature and humans as companion animals. However, the latter one has been dropped due to the lack of enough evidence. By considering the previous researches conducted with Dutch people, Polish people were hold less items and three images of relationship, instead of four images of relationship. In brief, for the images of human-nature relationship, Polish people adhered mostly to the Stewardship, by resembling the nature as a home and strongly rejected the Mastery over nature type.

Duong and van den Born (2019) conducted a study by using the ‘visions of nature’ as a framework to investigate the views of people toward nature and their relationship with it in an Eastern culture, Vietnam. For exploring the visions of nature of Vietnamese, researchers used questionnaire for three different elements of the visions of nature. Due to the differences in culture, several adaptations were made for the questionnaire. In total, 229 respondents from six different environments - particularly the urban, rural, forest environments- participated in the study. The findings of the study presented the views of Vietnamese people toward nature, valuation toward it and their relationship with nature, as well as the similarities and differences between Eastern and Western culture. According to the study results, respondents’ views toward nature identified as the domesticated nature and pure nature. While in domesticated nature exemplified with the gardens, parks, planted streets, in a word, its naturalness is relatively low; pure nature was also chosen by the participants which is viewed as a place where human artifacts does not exist and untouched by people. When considering the findings related to ‘values of nature’ element, all respondents scored the importance of nature as ‘important’ and ‘very important’. Their reasons for seeing the nature as important were ranked as health, future generations and intrinsic value and additional reasons such as farming, providing relaxation, scientific research, beauty of nature. In the images of relationship element, due to the cultural differences, types were identified differently from the Western culture. According to the factor analysis, types of HNR decreased into the three levels. While mastery over nature was viewed as a distinct image as in original types of HNR, Participant, Partner and Steward types of HNR classified under a type called as ‘Family with nature’. As a third factor, ecocentric image of relationship that constitutes the characteristics of partnership and participant were found in the respondents’ answers. While images of nature is seen from the respondents as domestic and pure nature, intrinsic value resulted above the instrumental values. Besides, the newly emerged type of ‘Family with nature’ was identified as most strongly agreed type of relationship which includes ideas related to conservation of nature. Lastly, although some differences emerged, in the study,

it was realized that the Visions-of-nature can be successfully adapted in the Eastern societies and can be considered as a universal framework (Duong & van den Born, 2019). Thus, when considering the culture of this study, the Vision of nature could be implemented easily, with some slight differences due to the participants and country.

2.2.1 Images of Nature

In order to make sense about the findings related to images of nature in general, the notion of '*nature*' should be defined. Nevertheless, defining nature is a very complicated task, because 'nature' is a very complex and contested word (Adams & Savahl, 2015; Macnaghten, 1993). There are variety of definitions can be encountered in the literature. While some includes humans in nature in their definitions, some thinks that the humans are separate from the nature (Fletcher, 2017; Hallås & Heggen, 2018). In the Western culture that stems from classical Greek/Roman times, nature is seen as the outside from the human community where the culture can be created; whereas, in Islamic cultures, humanity is the primary community in the created nature. Moreover, Bordeu (2004) defined nature as "the whole physical world; it is also what exists outside of any human actions" (p.10). According to Bordeu (2004), humans are in the nature as a member of it; however, they acts upon it and sometimes they are also considered as apart from the nature. Similarly, Macnaghten (1993) points out that the nature term used interchangeably with the 'wilderness' and is generally assumed as a place of untouched, undisturbed areas that ignores the humans' actions upon it. According to Macnaghten (1993); however, assuming nature as 'only' wilderness is inappropriate because the human intervention on nature should not be ignored as the humans should also the members of it. According to Hallås and Heggen (2018), considering humans as separate from nature is hard to understand because all over the world the human impact on nature, and humans' acts upon it are evident. Since humans are dependent on nature, humans should be considered as a part of nature (Hallås & Heggen, 2018). When considering

the supportive views given above, the present study defines nature as a un-artifactual, undisturbed, virgin areas (van den Born, 2008; van den Born & de Groot, 2009) that comprises all the biotic and abiotic components, including humans because they are dependent to and acts upon it.

It is a crystal-clear fact that the notions of '*nature*' and the '*human-nature relationship*' are strongly connected to each other and easily interrelated (Flint et al., 2013). According to Flint et al. (2013), one's views of relationship with nature is generally relates with the views of nature of that person. That is why, in the present study, the views of nature of middle school students were examined along with views on the human-nature relationship. To achieve explaining the views of human-nature relationship, first, images of nature were investigated with guided-imagery technique as one of the elements of visions of nature. For this reason, literature was reviewed in terms of how people conceive nature in general and in the educational context. Additional to the results shown under the 'Visions of Nature' framework related to images of nature, few studies were found that investigates solely the 'image of nature' of public, especially conducted with Turkish people (Bujis, 2009; Bujis et al., 2009; Kloek et al., 2017), while the images of nature is mostly found in educational context under the names of 'views of nature, perceptions of nature, conceptualizations of nature' with a huge body of literature (Pointon, 2014; Rios & Menezes, 2017; Adams & Savahl, 2015; Collado et al., 2016).

Images of nature can be considered differently in the literature and this term is used in studies, especially, conducted in Netherlands and Germany (Bujis, 2009; Bujis et al., 2009). Bujis, Elands and Langers (2009) indicates that the image of nature is the term that reflects people's cognitive representations of previous experiences with nature and the conceptualizations of people about the nature. While in some studies images of nature includes both the views of people regarding what is nature and the values of nature by indicating anthropocentric and ecocentric views, other studies separatetly examining the images of nature and values of nature (Bujis et al., 2009). In addition, some studies include types of nature in the visions-of-nature concept and

classifies the people's views on nature types as 'Arcadian nature', 'Wild nature' and 'Penetrative nature'.

In this study, images of nature focused on only what people understand from nature, how they define it and views it (van den Born, 2008). Besides, the types of nature indicated in the literature was not examined in the scope of the present study; however, findings were discussed by taking into account the results emerged in the literature.

2.2.1.1 Studies about Images of Nature with Public

In this section, studies related to investigation of images of nature of people in public -especially adults- are presented. Since the construct of visions of nature is studied mostly in Netherlands, literature related to images of nature is generally encountered from Dutch researchers. Two studies (i.e. Kloek et al., 2017; Bujis et al., 2009) are found that is conducted with the Turkish young people whose ages are above eighteen.

Bujis (2009) aimed to examine the different images of nature from public people. In the article, images of nature were examined in a more comprehensive way by considering values, beliefs and value orientations characteristics while determining types of images of nature of public. The participants of the study was selected from the lay people, whose ages ranges 18 to 85. The results were gathered with the help of two qualitative studies by using semi-structured interviews. As the first qualitative study, respondents were asked about how they define nature, appreciate it, behave to nature, and what they consider about the management of natural areas. Respondents were shown 25 different pictures of natural areas including agricultural areas, forests and parks which includes animals and humans in this pictures. In the second study, topic was focused, for example, by examining nature restoration in flood plains, which is a very debatable issue in the Netherlands (Bujis, 2009). As a result of the study, Bujis (2009) identified five ideal types that people have for the images of nature which are named as 'Wilderness', 'Autonomy', 'Inclusive', 'Aesthetic',

‘Functional’ images. In wilderness image, nature is viewed as pristine nature, where there is lack of human impact on nature. In the wilderness image, existence of human-made constructs made the nature less real, decrease its naturalness and this image of nature focus on protection of species. Autonomy image of nature is similar with the wilderness image; however, instead of focusing on the human-made materials, the real nature is viewed as where autonomy of natural processes exists. Besides, without limiting it with nature reserves, nature can also be considered as city, garden and roads as nature. In the inclusive nature image, humans and other livings are mutually dependent and nature include humans. In the aesthetic image of nature, the beauty and aesthetic of nature is in the focus ; while the functional image focuses on the utilitarian point of view of humans, which can be defined as an anthropocentric image.

Bujis, Elands, and Langers (2009) investigated the similarities and differences between images of nature of two different groups which are native Dutch people and the immigrants from the Islamic countries Turkey and Morocco. Data were collected from 300 immigrants whose nationality were Turkish and Moroccan and 318 native Dutch people with the help of the quantitative survey by applying factor analysis. Apart from that, the values of nature was also embedded under the images of nature construct in the study of Bujis, Elands, and Langers (2009). According to the analysis for exploring images of nature that comprises both preferences of types of nature and their values toward nature found under three categories which are called as wilderness image, functional image and inclusive image. In the wilderness image of nature, participants strongly disagreed with the anthropocentric views and they supported to minimise the usage of nature by the humans. These respondents adhered to the type of independent nature where floodings, marshes and weeds between pavements can be seen as nature. Functional image of nature is strongly agreed with the anthropocentric values and supported the management of nature by the humans. In the inclusive image of nature, anthropocentric values are rejected as in the wilderness image. Besides, productive nature areas such as farms, parks; domesticated nature areas where domesticated animals and humans are included; and

the independent nature type which is not include humans and any production purpose was accepted in this image of nature. When comparing these results of immigrant Turkish and Moroccan people with the Dutch people, it was seen that Dutch people strongly adhered to wilderness image, while the immigrant participants generally feel close to functional image of nature compared to Dutch people. Additionally, it is found that Turkish and Moroccan people supported the functionality image of nature, by giving anthropocentric reasons for the humans' management on nature with 44%, while Dutch people endorsed the functional image with only 15%.

Another study conducted by Kloek et al. (2017) examined the young people's the images of nature and values of nature. The study was conducted with the immigrants of Netherlands which were Turkish and Chinese young people and the non-immigrant Dutch people. The purpose of the study was to explore the differences and similarities between participants' understanding of nature and their valuations towards nature (Kloek et al., 2017). The study was employed by using both quantitative and qualitative methods and both the survey and group interviews were employed for the data collection. Under this section understanding of participants' toward nature was presented, while the values of nature part of the study can be found under the 'values of nature' section of the chapter. While the effect of different cultures such as traditional Western views, traditional Islamic views and the traditional Chinese worldviews on the views of nature was investigated in the study, the comparisons between these three cultures were made by Kloek et al. (2017). According to the analysis of both quantitative and qualitative parts of the study, participants generally regarded green areas as the real nature by emphasizing mostly the 'forests', as it is found in this study. Following 'forest', green, animals and plants were used mostly by all the participants. When to be specifically reported, while describing the nature, Turkish people used more abstract and more non-specific words than Chinese and Dutch people, by expressing concepts like the 'green', 'greenspace', 'animals' and 'plants' without giving clear examples (Kloek et al., 2017). Besides, it is emphasized in the study of Kloek et al. (2017) that the Turkish participants generally emphasized the function and services of nature such as

providing oxygen, health for humans and the environmental issues than the other ethnic groups in the study.

2.2.1.2 Studies about Images of Nature of Students

Under this section, studies (Adam & Savahl, 2015; Collado et al., 2016; Pointon 2014; Rios & Menezes, 2017) related to images of nature of students from different ages were presented.

Pointon (2014) investigated the conceptions of 384, 13-14 years of students and their relationship with nature by conducting a qualitative research design. Since in the interview, Pointon (2014) asked what nature means students and whether nature is important for them and why, images of nature and values of nature is examined, respectively when considering the visions of nature. In this part, findings about how students conceive nature in Pointon's (2014) study was reported. According to the analysis, students were found to have two different conceptions of nature namely 'Aesthetic nature' and 'Scientific nature'. Although in the 'Scientific' view of nature, students were generally described the nature by emphasizing the animals, plants and more specifically include terms like green stuff and trees, most of the students excluded the humans as a component in nature. In the 'Scientific' conception of nature, even it is mentioned less than biotic elements, additional to the biotic components, abiotic components were mentioned. Moreover, nature was seen as where natural processes occur such as eruption of volcanoes, earthquakes. In the 'Aesthetic' conception of nature students used more abstract words such as beauty, powerful, spiritual, relaxing, fragile.

Adams and Savahl (2015) conducted a study with adolescents whose ages ranged between 13-14 years old in the South Africa. The study was explored the participants' perceptions of nature with the help of the focus group interviews. According to the meanings of results emerged by the themes, students perceived nature as (i) threatened place, (ii) external to self, (iii) dangerous other, and (iv) intrinsic care for nature.

A study conducted in Spain by Collado, Íñiguez-Rueda, and Corraliza (2016) examined how young children, aged between 6-12 years, conceptualize the nature. In the study, the role of daily experiences in students' place of residence were considered while the students' construction of nature is explored. To achieve this, researchers collected the data from students that live in three different place of residence such as urban, rural mountain and rural agricultural regions. Briefly summarized, the possibility of relationship between the students' type of experiences with nature in different regions and their conceptualization o nature was investigated. In order to conduct the study, 832 students from twenty schools were selected as participants. Students were asked to answer an open-ended question which required to write their thoughts when they are told 'nature'. Students' leisure times spent after school and weekends were also asked and the frequencies of their times spending in nature was analyzed. According to the content analysis, four theme were emerged for explaining the conceptualization of nature of students which are 'natural and non-natural elements', 'the human-nature relationship', 'emotional experiences in nature' and 'actions in natural setting'. In general, students used to terms such as trees, plants, animals, birds, flowers while describing the nature. Following these, water resources such as rivers, lakeside and sea were most frequently used verbs. Except from explaining the what nature is, they emphasized what nature is not by indicating that the nature do not include human-made constructs, is a place far away from city, its noise and pollution. Emotional responses come from the students were tranquility, feeling relaxed, feeling free, away from everyday demands, beautiful, happiness, fun.

Rios and Menezes (2017) conducted a study with children aged between 5-10 years old for discussing their views of nature and how they know about it. In their study, focus group discussion were made and the interviews were conducted with the help of the guided-imagery technique. Images of nature of the children were investigated by considering what kind of components they visualize, what kind of roles they assigned to these components, natural setting they imagined and used materials and acitivites in the imagery when they are directed to imagine themselves doing something in nature. Findings of the study revealed that the children feel intense

affiliation toward the nature (Rios & Menezes, 2017). Additionally, students overwhelmingly emphasized the importance of protecting the nature and taking care of it from the moral aspect. These students also criticized the humans' destructive impact on nature and natural beings.

2.2.2 Values of Nature

To understand values of nature, it is important to describe what value is. In the literature, there are several definitions in different fields were provided for the abstract notion called '*values*'. According to Schwartz (2012), values can be defined as what is important in one's life for guidance. Values of people are widely known to impact on the environmental worldviews of individuals (i.e. images of relationship), then influence on their beliefs, which in turn reflect on their personal norms and behaviors as indicated in the Value-Belief-Norm (VBN) Theory proposed by Stern et al. (1999). More specifically, 'values of nature' also described and investigated in different categories.

While environmental ethics categorized values as the anthropocentric and biocentric values, some of the researchers (Kellert, 1996, 2002; Rolston , 1981; van den Born, 2008) uses very distinct categories of values. To illustrate, Kellert (1996, 2002) addressed nine basic values of nature as (1) an aesthetic value (2) a dominionistic value (3) a humanistic value (4) a moralistic value (5) a naturalistic value (6) a negativistic value (7) an ecologic–scientific value (8) a symbolic value and, finally; (9) a utilitarian value.

In addition, Rolston (1981) proposed ten values of nature as (1) economic value, (2) life support value, (3) recreational value, (4) scientific value, (5) aesthetic value, and (6) life value. Then four more complex values are described, two of which are pairs of complementary values; (7) diversity and unity values, and (8) stability and spontaneity values, (9) dialectical values and (10) sacramental values.

On the other hand, van den Born (2008) indicated that values can be considered in two levels, which are ‘qualities of nature that are important to people’ and the ‘moral guidelines’ (p. 86). The former level was related with the reasons of people why they value nature. van den Born (2008) categorized the reasons under three parts as intrinsic, instrumental and neither intrinsic nor instrumental. In the present study, values of nature was investigated under the framework of visions of nature as expressed in the first level, which identifies whether people see nature as important or unimportant and what the reasons behind their valuation toward nature (van den Born, 2008). Therefore, in this study, values were examined under three categories as intrinsic values, instrumental values and neither intrinsic nor instrumental values as van den Born (2008) proposed.

Although there are ongoing debates whether the intrinsic value still exist in the absence of humans or its presence is independent from the human observers, it is explained and embraced in this study that ‘*intrinsic value*’ is the ‘value someone or something has in or for itself, irrespective of its function for others’ (van den Born, 2008, p.87). ‘*Instrumental value*’, in other respect, value that considers humans’ usage of nature for benefiting them (van den Born, 2007). In the following sections, studies related to the values of nature were presented by focusing on views of public and students separately.

2.2.2.1 Studies about Values of Nature with Public

In the study of Kloek et al. (2017), apart from examining the participants’ images of nature, values of nature of Turkish, Chinese and Dutch people were explored. In the study that is conducted as quantitatively and qualitatively, quantitative results were provided that 65% of the participants found nature as very important, while only 8% of the participants indicated it as very unimportant. In general, all participants from three ethnic groups were mentioned that the nature has anthropocentric value. In addition to anthropocentric value, at the same time, it is indicated for specifically Turkish people that importance of nature mostly with 94% by pointing out the

ecocentric value of nature (Kloek et al., 2017). Additional to these two reasons of value of nature, the religious reasons were mostly seen in Turkish people, when compared to Chinese and Dutch people. From the Turkish people's point of view, it was found that the nature should be well-preserved because it is the creation of God and they attribute the value of nature to the divine intentions.

Apart from the images of nature found in the study of Bujis et al. (2009), beliefs, values and value orientations of lay people were detected. According to the results for values, anthropocentric and non-anthropocentric values were revealed explicitly. While respondents focused on the economical and aesthetic functions in the scope of the anthropocentric values, non-anthropocentric values were seen in two different categories as individualistic (biocentric) and holistic (ecocentric) values. In their individualistic values, people value the individual livings and consider their well-beings is important. Differently, people with holistic values stated the quality and importance of ecosystem and focused on the protection of ecosystems as a whole.

2.2.2.2 Studies about Values of Nature with Students

To the best of researcher's knowledge, since there is a lack of studies about the views of children and adolescents related to contemporary life and values toward nature (Liu & Lin, 2014; Pointon, 2014), very few studies have investigated solely on the students' values of nature in the literature. These few studies (Hallås & Heggen, 2018; Pointon, 2014; Sjöblom & Wolff, 2017) found in the literature that is conducted with the students from different age groups can be seen in this section.

In addition to the findings of Pointon (2014) related to the conceptions of nature of students, in her study, how the students give importance to the nature and why they care the nature were asked. According to the results, Pointon (2014) categorized the students' relationship with nature in two categories as utilitarian and intrinsically valued. When considering the values of nature categories of this study (i.e. instrumental and intrinsic values), Utilitarian students who give importance to the nature because it is providing sources to humans for their survival, can be likened to

instrumental value category. On the other hand, as its name implies, students, who categorized as 'Intrinsically valued', gave importance to nature because they emotionally or morally related themselves with it and this category can be related with the 'intrinsic value' as stated in this study. Moreover, Pointon (2014) examined the worldviews of students regarding their conceptualizations of nature and relationship with it under Anthropocentric, Ecocentric and Human-related worldviews categories. According to Pointon (2014), students with anthropocentric worldview gave importance to nature because its benefits for humans such as source of living, source of civilization, which can be related with the instrumental value with the present study. Besides, Ecocentric worldview in the study was linked with the intrinsic value by emphasizing the value of nature as its own characteristics morally. Lastly, in the Human-related worldview, it is emphasized mostly that nature is there before human-beings.

In the study conducted in Finland by Sjöblom and Wolff (2017), it is investigated that what values of nature do Finnish upper secondary students express. The goal of the article was to uncover students' values toward nature with the help of the semi-structured interviews. Participants were selected from the students whose ages ranged between 16-17 years old, whose interest toward nature categorized as high, intermediate and low; and whose gender divided into half as female and male. According to the content analysis, findings of the study showed that all of the students, even whose interest toward nature is very low, indicated nature as important and emphasized that it should be protected. Students' values towards nature was examined under six values such as material value, recreational value, aesthetic value, biodiversity value, future value and a holistic value. The students who were categorized under the material value mentioned the nature as a source of materials for people to live such as supplier of foods, materials for industrial productions such as paper, furniture, buildings, and supplier for energy such as warming and fuels for vehicles. Recreational value, on the other hand, was linked to the students' leisure-times and they indicated the importance of spending time in nature is important, therefore the nature should be protected. Students emphasized the importance of

nature by indicating its aesthetic value. They stated beauty of nature with beautiful scenes and they mentioned if trees would not be exist, the nature look boring. In the biodiversity value, students noted the intrinsic value of nature by emphasizing the right of animals and plants to live; therefore, they find important humans to protect nature to preserve the biodiversity in the nature. Some of the students mentioned that the nature has a value and should be protected for the future generations' well-being. Future value is associated with the anthropocentric value which in turn can be linked with the sustainable development. Nevertheless, none of the participants mentioned the sustainable development in the study. For the last value, holistic value was pointed out which means that nature is everything around them. These students value nature as a whole, where the humans and other livings constitutes an ecological identity. In addition, some of the students' value towards nature were found as mixture of these six values.

Hallås and Heggen (2018) explored what children states about nature and from which point of view they value nature. In order to analyse what children says about nature and how they value it, they used a matrix called as NatCul which is liken a coordinated system that divides their statements to anthropocentric/ecocentric and celebrating/problematising views (p.263). While anthropocentric/ecocentric view shows how they place humans in nature; feelings of importance being connected to nature is measured with their celebrating and problematising views. According to the analysis made with the NatCul matrix, there emerged five categories which are anthropocentric-celebrating; anthropocentric-problematising; ecocentric-celebrating; ecocentric-problematising and the midpoint of anthropocentric-ecocentric views with the midway of celebrating-problematising view which focuses the value of nature from the scientific view. In anthropocentric-celebrating view, children were view nature from anthropocentric view by utilizing from it with picking up fruits, enjoying nature; but at the same time they states that they are having positive emotions toward nature. This type of valuation of nature was linked to the Kellert's (1996) utilitarian value of nature. In anthropocentric-problematising view they generally stated negative point of views what can be occur when the nature is not

protected such as if nature does not exist, humans will die. These students generally touch on the humans' dependence on nature and importance of nature due to the supplier of life for the humans.

2.2.3 Images of Human-Nature Relationship

One of the purposes of this study was to examine the views of students regarding own and others' types of HNR. In order to show the background of the present study, first the definitions and usage of the important terms and, second, studies from the literature related to the images of human-nature relationship was examined in this section.

In general terms Norton (1991) defines the worldview as a group of beliefs, values and concepts, which give meaning to the people's life (as cited in van den Born, 2008). Similarly, worldviews are considered which provides information about how humans interpret the reality, in which they live and gain experiences (Braitto et al., 2017). In line with these, but more specifically, environmental worldviews describe how individuals view nature and establish relationships with it (Liu & Lin, 2014). Similar to the Liu and Lin's (2014) definition, '*environmental worldviews*' are regarded as the 'views of people have for proper relationship with the nature' (van den Born, 2008). In the present study, environmental worldviews are called as the '*images of relationship*' (van den Born, 2008), in which these images of human-nature relationship were distinguished as Master, Steward, Partner and Participant. Parallely, Braitto et al. (2017) used the terms '*HNR types, HNR typology*' by referring the van den Born's (2008) definition of images of relationship. In other words, definitions of images of relationship (van den Born, 2008) and HNR typologies/types (Braitto et al. 2017) corresponded each other and both terms include images that explains the appropriate relationship between nature and human. Therefore, additional to the images of relationship proposed by van den Born (2008), three more HNR types from Braitto et al. (2017) which are called as User, Apathy and Nature Distant Guardian were used in this study. In this way, images of human-

nature relationship of students were analyzed more specifically and ultimately make possible to understand how humans should behave to nature (Braitto et al., 2017). Although there different types were introduced and aimed to identify the students' views on their own and on other people's images of HNR, in the literature, it is pointed out that the people feel close more than one HNR types (Yoshida et al., 2018; Braitto et al., 2017).

As can be understood from the previous explanations, images of human-nature relationship (HNR) can be defined and presented in wide range of diversity. For this reason, in the literature concepts and types related to HNR overlap and corresponds with each other (Flint et al., 2013, p. 210). In other words, in the literature, human-nature relationship concept and its types sometimes presented under the names of environmental worldviews, values, value orientations, attitudes, ethics, traditions, philosophy and is mentioned with environmental behaviors and lifestyles (Flint et al., 2013; van den Born, 2007). In this regard, while some studies examine the human-nature relationship from the theoretical and philosophical basis (Zweers, 2000); some of the studies focused from more of the socially scientific view (Dunlap et al., 2000; Schultz, 2002; Thompson & Barton, 1994; Xu & Bengston, 1997). Some of the researchers (de Groot & van den Born, 2003; van den Born, 2007; de Groot et al., 2011) focused from theoretical frameworks by operationalizing and applying the types both quantitatively, while other researchers (van den Born, 2008; van den Born & de Groot, 2009; de Groot & de Groot, 2009; Fischer & Young, 2007) studied qualitatively and with mixed methods (van den Born et al., 2001; Braitto et al., 2017). Lastly, some studies contributed to the literature by reviewing articles (Flint et al., 2013). Apart from these studies, human-nature relationship was studied in the educational context (Bögeholz, 2006; Meske, 2011; Li & Ernst, 2015; Liu & Lin, 2014) with different namings. In the further sections, firstly the studies about images of relationship conducted with the adults were presented that is applied with quantitative, qualitative and mixed methods. Secondly, studies about images of human-nature relationship conducted with the students were mentioned.

2.2.3.1 Studies about Images of Human-Nature Relationship with Public

In a study that reviews articles, Flint et al. (2013) aimed to review the literature in order to clarify the broad array of types of human-nature relationships (HNR) empirically among the wide range of heterogeneity and to assess how these HNR types help for environmental actions can. To achieve these, they searched for empirically grounded concepts of HNR and reviewed English, German and Japanese resources related to the typologies of HNR from the literature. Flint and colleagues (2013), besides, link the findings of different typologies from the literature with the ecosystem services framework. In the study, Flint et al. (2013) emphasized that terms about the typologies of human-nature relationship overlap and are blurry to interrogate. In fact, some of the typologies which are also the most commonly used ones, mentioned by some researchers as ‘values’ (Flint et al., 2013) in the literature. Additionally, although Flint et al. (2013) tried purely examine the typologies of HNR in their review, they stated that separating the nature concept from the human-nature relationship is impossible in some studies. For this reason, in their empirical literature review, Flint et al. (2013) chose nineteen empirically grounded studies to review by selecting researches where the focus is on relationship between humans and nature, and where the nature is understood as natural environments. They examined different typologies of HNR and they realized that these typologies can be categorized under three main dimensions named as "*positionality*", "*character of bond dimensions*" and "*understanding of nature dimensions*". Under the positionality dimension, they examined the typologies that emphasize the positions of humans and nature by naming "*antropocentric-ecocentric polarity*", "*humans as part of/separate from nature*" and "*humans above or nature above*". According to their analysis of literature review, they found that mostly emphasized position of humans in the positionality dimension was "*antropocentric-ecocentric polarity*" and "*human over or dominating nature (or vice versa)*" in the typologies. Under the character of bond dimension, typologies found in the literature were categorized as intention of action, biophila/biophobia, responsibility/rights, role of technology, spirituality,

instrumental/intrinsic and connectess/apathy. In this dimension, "*instrumental/intrinsic*" and "*connectedness/apathy*" was the mostly highlighted concept. For the last dimension, which is understanding of nature, is more related with the images of nature and concept of nature was examined as fragile/resilient, predictability of nature and as experiential learning/scientific learning. With examining different typologies of HNR, Flint et al. (2013) both help to organize and review literature and connect these typologies with the ecosystem services (ES) framework by situating it with the anthropocentric and utilitarian view of HNR typology. From this section on, images of relationship that were found from the literature review of Flint et al. (2013) and additional articles were presented in the following to show how typologies of HNR were categorized and explained in different studies.

Several human-nature types were distinguished philosophically and environmental worldviews of people were considered when the categorizations of HNR types were formed which date back to the 1970s and 1980s. To make a quick review to the studies within the five decades, it should be mentioned the typologies of HNR that is proposed by Passmore, 1974; Barbour, 1980; de Groot, 1992. Additionally, van den Born (2007) added two more researchers who propose images of relationship between humans and nature; however, since these resources were in Dutch, the classification of HNR types of Zweers (1989) and Kockelkoren (1993) were provided as cited in van den Born (2007).

By considering the HNR types, Passmore (1974) defines the images of relationship as worldviews of humans and classifies the relationship of humans with nature as despot, co-operation with nature, stewardship and natur mysticism. While 'despot' type is more like to the 'Master' type in the present study as indicated by van den Born (2007, 2008); 'cooperation with nature' is like adressed as the 'enlightened master' (van den Born, 2007, p. 66). Zweers (1989) differently categorize the images of relationship and provides six distinct types of HNR called as despot, enlightened despot, steward of nature by dividing it into two as active steward and passive steward, partnership with nature, participant in nature and the unio mystica. Each of

them corresponds to the typologies of HNR that present study used. While despot and enlightened despot resembles to the types of Passmore (1974) addressed, these images of relationship can be included in the 'Master' type of HNR. Latter three types, steward, partner and participant have the same characteristics as stated in the present study. However, unio mystica can be called as deep ecology like referred in the literature, such that the humans are directly and spiritually connect with the nature and fused with it. It can be similar with the participant, but as a more intense way of perception.

Barbour (1980), on the other hand, defines the images of relationship as the attitudes toward nature and classifies under three different categories as 'the traditional Western attitude-of-oppression', 'unity of nature' and 'stewardship'. There is another classification which divides the images of relationship as 'man the technocrat-adventurer', 'man the manager-engineer', 'man the care-taker', 'man as the guardian', 'partnership with nature' and 'participation in nature' (de Groot, 1992) which represents the master, steward, partner and participant. Kockelkoren (1993) distinguishes typologies of HNR as the same with the van den Born (2008) classified and as it is used in the present study. However, Kockelkoren (1993) divided each of these four category into two for each types, such that Master type includes despot and enlightened master; steward and partner includes conservative and progressive kinds; participant is divided into two as participant and nature mysticism.

Apart from these classification of images of relationship in the literature, studies done related to the typologies of HNR are massive in the Dutch literature (van den Born et al., 2001; de Groot & van den Born, 2003; van den Born, 2008; van den Born & de Groot, 2009; de Groot & de Groot, 2009; de Groot et al. 2011) and generally referred as 'Images of relationship' under the heading of 'Visions of Nature' construct, which is an umbrella term that includes 'values of nature', 'images of nature' and 'images of relationship' (van den Born et al., 2001). In other words, Dutch researchers uses the notion of 'Images of relationship' rather than typologies of HNR. When looked in the literature, it can be seen that the images of relationship

and typologies/types of HNR can be used interchangeably (Braitto et al., 2017), as did in this study.

In the study of de Groot and van den Born (2003), the public opinions toward images of nature and images of relationship were examined as stated in the previous sections. According to the quantitative survey results and from the factor analysis three images of relationship were came into prominence which are mastery over nature, responsibility for nature and participation in nature.

van den Born (2007), in one of the chapters of her dissertation, focused on the philosophical categorization of images of HNR. A survey was conducted with the 913 participants in Netherlands in order to find out whether the philosophical images and the images of relationship that people shared is related or not. According to the factor analysis results, it was found that the Dutch people hold the similar typologies as indicated philosophically, they hold several typologies even in different ages, genders and educational levels and it is concluded that Dutch people have both Steward of nature and Participant with nature typologies at the same time (van den Born, 2007). Other than these findings, in the chapter, van den Born (2007) made a overview of philosophical images of relationship classifications in the literature for looking at the relationship.

de Groot et al. (2011) examined the empirically grounded human-nature relationship images by using HaN (Human and Nature) Scale conducting in the France, Germany and Netherlands. A total of 1811 questionnaire returned for analysis. Among the typologies of HNR, Master, Guardian, Partner and Participant, it is found that the respondents can separate two types of ecocentric images which are participant and partner. Besides, it is found that the respondents placed the stewardship (guardianship) image more ecocentric than it is stated philosophically. Lastly, master images of relationship was found less anthropocentric than it is defined in the environmental philosophy.

Apart from the studies of Dutch researchers, in the study of Bauer et al. (2009), images of relationship were considered as the attitudes towards nature. They stated

that different types of HNR may held different kinds of attitudes toward nature. They aimed to explore the attitudes of people in Switzerland to make the nature wilder again and provides new preferences for landscape change in nature. A questionnaire was employed to 4000 respondents and 1536 were returned completely for analysis. According to the analysis, there is found four different types called as ‘nature lovers’, ‘nature sympathizers’, ‘nature-connected users’ and ‘nature controllers’ which have similar definitions with the typologies of ‘master over nature’, ‘steward of nature’, ‘partnership with nature’ and ‘participant in nature’ proposed by the van den Born (2008). After mentioning the quantitative studies, qualitative studies conducted related to the images of HNR can be found in the following.

With the study of van den Born (2008), the visions of nature of lay people living in the Netherlands were investigated. While doing interviews with the lay people, opportunity for learning their own ideas related to the human-nature relationship was aimed (van den Born, 2008). Simple schemas –showing the relationship between the nature and human as clusters- were presented to the participants of her study. Typologies of HNR presented were named as Master, Steward, Partner and Participant. A part of this study was constructed by adapting the typologies of HNR like named by van den Born (2008). According to the result of ‘images of relationship’ part of the study master over nature image was rejected by the participants because of their moral considerations. Partnership, likewise, was not selected as a popular view because most of the participants had stated they are not separate from nature to feel like equal, rather they feel as part of the nature. Other two typologies named Steward and Participants were favoured by the participants because the participants were close the idea of being responsible from the nature and being a part of nature as humans, respectively.

Fischer and Young (2007) who studied individuals’ mental construct of biodiversity, used qualitative approach in their study and investigated how participants perceive biodiversity issues. Data collected by participants with verbal interviews and they are asked to draw picture what comes to their minds when said ‘biodiversity’. According to the results, humans’ place in the biodiversity concept was seen as

separate from the nature. Views of participants regarding what the role of humans with nature is can be categorized under three main categories as ‘humans as potential enemies of nature’, ‘humans as users of nature’ and ‘humans as active managers of nature’.

When considering the studies regarding typologies of HNR, Braitto et al. (2017) aimed to fill three gaps found in the literature, which are lack of consensus and clarity related to HNR concepts, lack of empirical scale to assess HNR concepts and the lack of evidence related to the correlation between HNR and the environmental behavior. Both qualitative and quantitative methods were used in the study to operationalize the types of HNR and make it clearer to use in the literature. Both the interviews and surveys were conducted with the stakeholders whose expertise field is agriculture and water management and with university students. They stated that with the aid of interviews of lay people and expanding the findings of literature related to the typologies of HNR (de Groot & van den Born, 2003; van den Born, 2008), at the end, seven typologies and their narratives were constituted. Braitto et al. (2017) expanded the types of Master, Steward, Partner and Participant by adding them three additional types called as User, Apathy and Nature Distant Guardian. With adding three new typologies to the van den Born’s (2008) four typologies, typologies of HNR proposed in the article of Braitto et al. (2017) were considered as more comprehensive and detailed. In the present study, thus, Braitto et al.’s (2017) seven typologies of HNR were used. In the present study, in addition to the explanations of seven typologies proposed by Braitto et al. (2017), definitions of four typologies proposed by the van den Born (2008) were also benefited while preparing the narratives of the typologies that was presented to the participants. Another reason behind why the typology proposed by the Braitto et al.’s (2017) was used in the study is to understand the views of students related to role of technology in the relationship of humans with the nature.

In the study of de Groot and de Groot (2009), some typologies were named differently, such as guardianship of nature rather than usage of ‘Stewardship’ and companionship with nature rather than named as Partnership. Other two typologies

they were used in their study were the same with previous researches which are master over nature and the participant in nature.

In the study of van den Born et al. (2001), when considering the categories of ‘images of relationship (images of human/nature relationship)’, they nominated the images (a.k.a typologies) of human-nature relationship from most anthropocentric view to the least anthropocentric view as humans as the technocrat-adventurer, manager-engineer, steward of nature, guardian of nature, partners with nature, participants in nature and oneness with nature (p. 68). According to the results of the study conducted with the general Dutch public, majority of the public reported that humans are part of nature and responsible from it.

When examining the images of relationship from the Eastern culture, Duong and van den Born (2019) made factor analysis for the aforementioned study and found the images of HNR under three factors which are Mastery over nature, Family with nature and Ecocentric relationship. While Master over nature were stayed as the same characteristics in the van den Born (2008), Family with nature incorporates types of Participant, Partner and Steward at the same time. Lastly, ecocentric image of relationship embodies the characteristics of partnership and participant according to the factor analysis.

2.2.3.2 Studies about Images of Human-Nature Relationship with Students

Bögeholz (2006) examined the relationship students have with nature by looking it from their natural experience types. In the study, they analyzed the empirical German literature related to nature experiences of students. When considering the nature experiences types part, in the study of Bögeholz (1999) published in German language, relations of children with nature is examined under their nature experiences and these experiences categorized under four types as aesthetic, social, instrumental-scientific and ecological-scientific.

As an educational context, a comparison study was completed with the seventh grade students about their value orientations toward HNR (Li & Ernst, 2015). Like mentioned by the Flint et al. (2013, p. 209), Li and Ernst (2015) considered the typologies of human-nature relationship as 'values' to describe the types. In the study of Li and Ernst (2015), there emerged different categories related to value orientations towards HNR such as 'humanistic', 'interdependence', 'stewardship', 'use' and 'dominion'. The value orientations toward HNR of student from USA and China is compared and resulted that 'interdependence (which is similar to the Braito et al.'s (2017) partner type)' and 'stewardship' types are seen mostly.

Furthermore, Liu and Lin (2014) studied with the undergraduate students' ideas about nature and HNR. It is resulted three worldviews such as 'humankind part of nature', 'humankind as a dominator', 'humankind as responsible to protect nature', similar to Braito et al.'s (2017) types of master, steward and partner. Since van den Born (2008) also mentioned that the images of relationships can be defined as environmental worldviews, this study was presented under the studies about the typologies of HNR. Additionally, as cited in the Flint et al. (2013), two studies were conducted with the children by the Bögeholz (2006) and Meske (2011).

Additionally, Kalvaitis and Monhardt (2012) try to explore how 176 children, aged between 6-11 years old, describe nature and human-nature relationship. In their phenomenographic study, draw and write methodology was used. Results of their study indicated that irrespective to grade level differences, human-nature relationship is depicted as favorable by the students. According to Kalvaitis and Monhardt (2012), while young aged children were depicted more about families, friends, animals, older age group picturized more natural areas, hiking. It is found, on the other hand, that the nature is meant in different ways to children. Nature is seen as home and ecological assets were understood that the social others, as a result, children also placed the humans as a part of it.

As can be seen from the studies conducted with different ages of students, there emerged some typologies of HNR, which are parallel to each other. In the present

study, both the perceptions of HNR and typologies of HNR were examined. It is used Braito et al.'s (2017) types of HNR in the study, as it is more inclusive with seven types, more contemporary than other studies and includes role of technology in HNR.

2.3 Place of Visions of Nature in Environmental Education

According to the North American Association for Environmental Education (NAAEE) (2007), one of the goal of the environmental education programs is to raise environmentally literate citizens. Accordingly, Levy et al. (2018) defined environmental literacy by considering three aspects, which are cognitive aspect that comprise of knowledge and skills; affective aspect, which mentions attitudes and perceptions of humans towards environment, and lastly the behavioral aspect that emphasize on the actions of people toward nature. Among these three aspect presented by the Levy, Orion, and Leshem (2018), affective aspect includes a remarkable variable named "Humanity's place in the natural system" (Levy et al., 2018, p. 310) that is considered in the literature as an effective factor for establishing environmental behavior. In a word, understanding humanity's place in natural system and how humans relate with the nature impacts how people behave in the natural environment. This aspect help researchers to understand whether people see "themselves as a part of the natural system, or as external to (or above) nature" (Levy et al., 2018, p. 310).

Since exploring the humans' place in natural system affects environmental literacy, and in turn environmental behavior, understanding the students' views on human-nature relationship come into prominence for well-established ecological world to live. In this regard, in this study, interviews done with middle school students were examined in terms of how they view humanity's appropriate relationship with nature, how they perceive their relationship with nature. In this way, with the help of the obtained views of students, new aspects can be added to help children make more environmentally literate citizens (Levy et al., 2018). In order to mention new aspects

for raising more environmentally literate citizens, preferences and goals of environmental education programs should be considered.

In this sense, two goals of environmental education programs mentioned in the Tbilisi Declaration made in 1978 by UNESCO are improving ‘awareness and sensitivity toward environment and acquiring ‘a set of values and feelings of concern for the environment’ (Ernst & Theimer, 2011, p. 579; Li & Ernst, 2015). Li and Ernst (2015) questioned whether the environmental education favor a specific worldview towards nature or not. It is seen, actually, that the environmental education prefer to raise individuals whose views toward humans’ relationship with nature as ‘Stewards’ or ‘Partnership’ with nature, instead of young people with the type of ‘Master’ and there is needed an education for helping students to feel responsible toward nature and future generations (Li & Ernst, 2015). By considering these goals and needs to educate students, the present study might be helpful for detecting whether the HNR types of students are hand-in-hand with the goals of environmental education or not. By exploring the students’ views on the images of relationship, educators and professionals in educational research might enhance the curricula of science education and would find alternative strategies to raise citizens who have responsibility to protect and behave equally to other natural beings.

In addition, Bonnett (2007) states that the development of humans’ moral, ethic and aesthetic appreciation are very important for psychology of humans and very central to the education. By considering its main component of the education, valuation of students toward nature was also investigated in this study.

2.4 Summary of Literature Review

An umbrella-term ‘Visions of Nature’ is an interdisciplinary framework that defines and includes several disciplines such as philosophy, sociology, psychology (Schultz, 2002). While some researchers (Bordeu, 2004; Kellert, 1993; Kellert & Wilson, 1993) defined and studied people’s views of nature and their relationship with nature from the philosophical perspective by referring values of nature people have; some

researchers (Dunlap et al., 2000; Goldman et al., 2014) focused on the sociological aspect for examining the human-nature relationship and humans' views of nature with pointing out public's worldviews in general. Moreover, the psychology was emphasized often from an affective aspect and mentions humans' well being in nature (Kahn, Severson, & Ruckert, 2009). In the historical views related to visions of nature, each of these perspectives proposed terms, hypothesis, ideas such as biophilia hypothesis, deep ecology, land ethic, Dominant Social Paradigm (DSP), New Environmental Program (NEP) and Eco-System Services (ES), inclusion with nature, connectedness with nature. To understand, detect and interpret the visions of nature of students in the present study, views from different fields was important to consider for an interdisciplinary framework.

This interdisciplinary framework, namely 'Visions of Nature', has three components images of nature, values of nature and images of human-nature relationship. Some of the studies focuses on all three components of visions of nature and examine the components as a whole (de Groot, 1992; van den Born et al., 2001; de Groot & van den Born, 2003; van den Born, 2007; van den Born, 2008; Hunka et al., 2009; Duong & van den Born, 2019). Apart from these, studies using similar constructs to visions of nature that is conducted with students in educational context can be also found (Pointon, 2014; Adams & Savahl, 2015; Adams & Savahl, 2017; Collado et al., 2016; Rios & Menezes, 2017; Hallås & Heggen, 2018; Sjöblom & Wolff, 2017; Liu & Lin, 2014). Briefly, findings of these studies showed that people's images of nature generally revolve around the idea that the less cultivated, the more nature is. In these studies, generally people exemplify the nature as green places such as forests, meadows, where humans do not distort the pristine nature.

When considering values of nature component, value of nature attributed to health, future generations, for survival and intrinsic value. Moreover, human-nature relationship types in these studies were regarded generally as the Master, Steward, Partner, Participant; while some of the studies found different types as 'family with nature' that includes both. Since the present study deal with all three components under the comprehensive term, On the other hand, some of the studies focus on only

images nature and values of nature without considering HNR types (Bujis, 2009; Bujis et al., 2009; Kloek et al., 2017) or some of them are just focising on human-nature relationship types (Braitto et al., 2017).



CHAPTER 3

METHOD

In this chapter, firstly, research design of the study was mentioned. Then, the characteristics of the participants and the natural setting of the study were presented. Afterwards, the data collection and analysis procedures of the study were explained. The trustworthiness of the study and the motivation of the researcher were presented. Lastly, ethical considerations and limitations of the study were discussed.

3.1 Research Design

The present study conducted by following the qualitative research method in order to examine and interpret visions of nature of middle school students in a detailed way.

Qualitative research methods are adopted in many different fields such as psychology, sociology, history, education, nursing, law, political sciences (Creswell, 2007; Merriam, 2009; Patton, 2014); therefore, there can be found many definitions of qualitative research in the literature. According to Creswell (2007), qualitative research inquires people's or group's social or human problems in a natural setting and explores the participants' understandings in-depth. Merriam (1998) sees the qualitative research as an "*umbrella concept*" that helps researchers to explain and interpret the social phenomena in a real-life context, through the lenses of participants, not the researcher itself.

When considering the definitions, in this study, qualitative research method was regarded as the most compatible research method for several reasons. Firstly, this study investigated the middle school students' views toward nature, values on nature and human-nature relationship in a real life context. The researcher tried to

understand the core-meaning of what participants says and draws from their perspective related to nature and views on human-nature relationship. Secondly, it was used multiple sources of evidence in order to examine the views of participants both from the words, drawing and selection of cards which identifies the typologies for human-nature relationship. Thirdly, the researcher was regarded as an instrument of data collection and analysis procedure, as the researcher interpreted the provided data from the participants' point of views. Lastly, the present study employs an inductive and comparative strategy as the researcher added and revised codes in the adapted coding rubrics.

Merriam (1998) proposes five major types as basic or generic qualitative research, ethnography, phenomenology, grounded theory and case study. Among these methods, case study matched with this study's characteristics; therefore, the present study was conducted as a qualitative case study. Yin (2018) depicts two-fold definition that "case study is an empirical method that (i) investigates contemporary phenomenon (the "case") in depth and within its real-life context, (ii) the boundaries between phenomenon and context may not be clearly evident." (p. 45). In addition, Yin (2018) states that the case study interests with many variables and uses theories developed beforehand to support the design of study.

When considering the characteristics of case study, present study is appropriate to be conducted by following the case study design. One of the reasons is that the present study investigated middle school students' views and values of nature and relationship with nature in a real-life context by considering the framework of 'Visions of Nature' (van den Born et al., 2001). Besides, this study uses multiple sources of evidences with the help of three different supportive data collection tools and interview protocol to triangulate and increase the reliability of the qualitative study.

Among the designs and the rationales provided by Yin (2018) related to types of the case study designs, 'Single-embedded' case design was found suitable for the present research (see Figure 3-1). One of the reasons of choosing single-case study design is

that this design is commonly used by the researchers and very justifiable when the cases are ‘*common*’ (Yin, 2018). Besides, single-embedded case studies are appropriate for analyzing and capturing the conditions in the everyday life with the help of the theoretical frameworks (Yin, 2018). Lastly, it is useful when one case is investigated with the subunits under it (Yin, 2018).

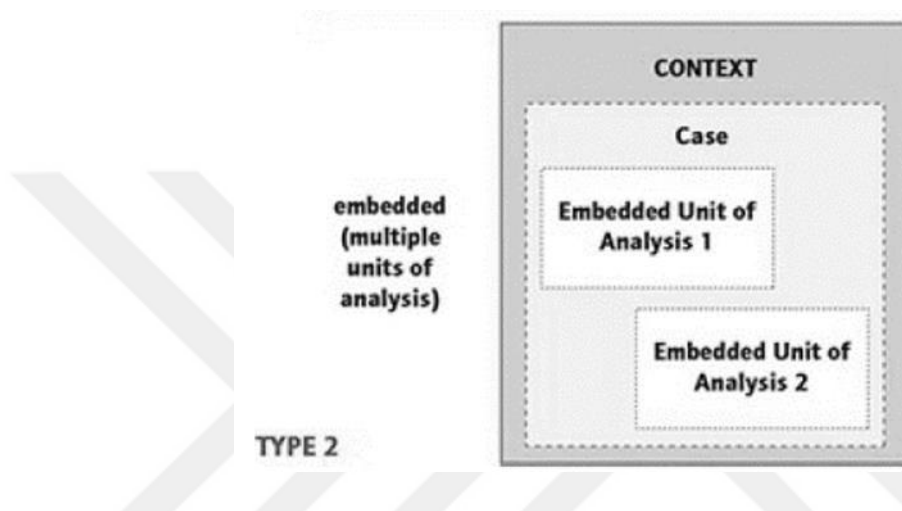


Figure 3-1 Single-embedded Case Study Research Design adapted from Yin (2018, p. 84)

For these reasons, the case of this study is a common real-life condition, which was the ‘visions of nature of fifth and eighth grade students’, where the context of the study is ‘views of middle school students on nature and HNR’. Since the case was investigated with the ‘Visions of Nature’ theoretical background, embedded unit of analyses are composed of four subunits, which are related to visions of nature construct, namely “images of nature”, “values of nature”, “students’ own images of

relationship” and “students’ views on other people’s images of relationship”. The single-embedded case study design of the present study can be found Figure 3-2.

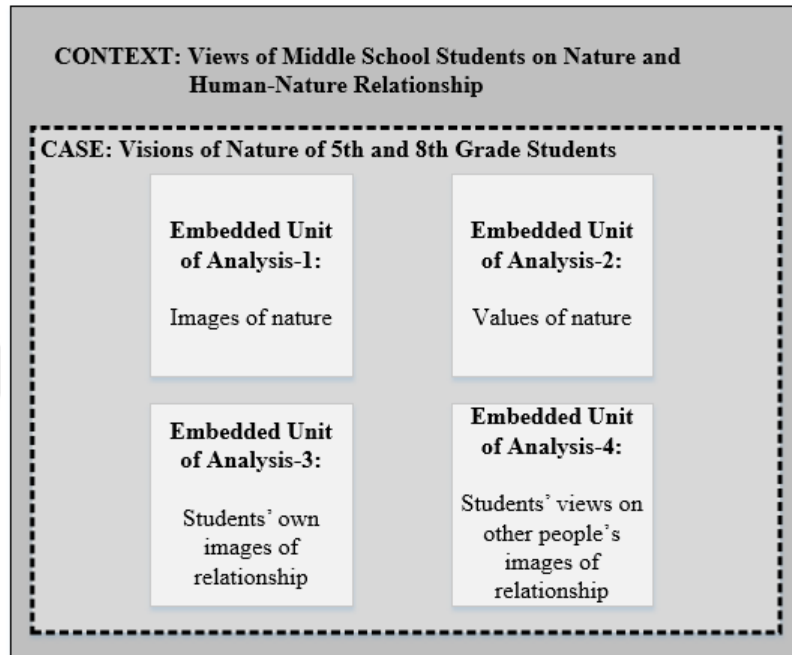


Figure 3-2 Single-embedded case study model of current study

To sum up, present study was conducted by following the Yin's (2018) single-embedded case study design, with four units of analyses in order to examine visions of nature of middle school students by means of one-to-one, semi-structured interviews with the aid of guided-imagery, drawings and card selection tools. In the following section, the participants and the setting of the study were explained.

3.2 Participants and Setting of the Study

3.2.1 Participants

There was a total of 13 middle school students participating in the study from the capital of Turkey, Ankara. Among these participants, seven of them was in the first year of middle school (fifth grade level) and six of them was in the last year of the middle school (eighth grade level) according to the Turkish Education System. While ages of fifth grade students ranged between 10 to 11 years old, eighth grade students' ages ranged between 13 to 15 years old. Regarding the gender distribution, seven of the participants were female, while six of them were male students. Throughout the study, pseudonym names were used for each student.

In order to present the participants' characteristics in terms of their social environment, the students' activities that they regularly do in their leisure times were provided in the Table 3-1. According to the table, it can be stated that students both spare their times outside and at the home; however, the participants of this study generally indicated activities that can be done at home. Outdoor activities were much less than the home activities in the statements of students. In other words, participants of this study more particularly engaged with the indoor activities than outdoor activities.

Apart from the leisure time activity preferences of students, it is important to provide past experiences of students that were spent in nature to analyze and discuss the results meaningfully. Wals (1994) states that everyone can see nature in different ways. That is why; he strongly supports the idea that experiences of children with nature can give insight related to their views of nature and both the current and future relationship with nature (Wals, 1994). For this reason, in order to introduce participants of the study clearer and to pave the way for meaningful interpretation for nature views of students, past experiences of each student were represented in the Table 3-2.

Table 3-1 Leisure Time Activities of the Participants

Participants	Indoor Activities			Outdoor Activities	
	Technological	Scholastic	Social	Hobbies	Sportive
Beren					
Elif	Watching TV/Movies at home with family Playing games (computer, playstation and board games)	Studying at home			Go for walk with family in forest/beach Going to shopping malls with family
Tunahan					
Deniz		Doing homework at home			Playing at outside/neighbourhood
Fatih	Watching TV/Movies at home with family				

Table 3-1 (cont'd)

Participants	Indoor Activities			Outdoor Activities		
	Technological	Scholastic	Social	Technological	Scholastic	Sportive
Ecem	Watching TV/Movies at home with family	Doing homework at home			Going to shopping malls with friends	
Funda			Playing with their pet			
Arda	Watching TV/Movies at home Playing games (computer, playstation and board games)			Reading book	Go for walk with family in forest/beach	
Mehmet		Studying at home				Playing football, tennis, volleyball
Emre	Playing games (computer, playstation and board games)					

Table 3-1 (cont'd)

Participants	Indoor Activities			Outdoor Activities	
	Technological	Scholastic	Social	Technological	Scholastic
Gamze	Watching TV/Movies at home			Resting in the couch Listening music Dancing at home	Go for walk with family in forest/beach
Gamze	Watching TV/Movies at home			Resting in the couch Listening music Dancing at home	Go for walk with family in forest/beach
Miray	Watching TV/Movies at home Playing with the cell-phone			Resting in the couch Playing chess	
Ezgi	Playing with the cell-phone			Painting Listening music	Go for walk with family in forest/beach
					Riding bike

Table 3-2 Past Nature Experiences of the Participants

Participants	Going for a walk in nature	Going to camping	Going to parents' village	Going to picnic	Discovering natural places
Beren	X				
Elif				X	
Tunahan				X	
Deniz		X			X
Fatih	X				
Ecem			X		
Funda		X		X	
Arda		X		X	
Mehmet				X	
Emre			X		
Gamze					X
Miray				X	
Ezgi	X				

As can be seen from the Table 3-2, most of the students indicated their experiences in the nature as 'going to picnic'. Their frequency of experiencing the nature activity they mentioned differed from student to student.

A summary can be made for each participant to expand on the introducing characteristics of the participants. While seven of the students generally mentioned outdoor activities and experiences in nature more often; six of them generally engage in indoor activities and they mentioned limited experiences in nature or experienced outdoor activities as a one-time experience.

3.2.2 Selection of Participants

As stated by Merriam (1998), researchers should prefer to select participants from whom most information can be gained easily. By taking into account these, in this study, purposive sampling method was considered as the most suitable method for

selecting the participant students, because purposive sampling enables researchers to determine the participants of the study by considering some criterions with respect to purpose of the study, which is indicated in detail, in the following.

Two main criteria were identified for selecting the participants of the study. The first criterion was that the participants should be fifth and eighth grade students whose ages are ranged between at least 10 and at most 15 years old, because these years have particular characteristic for being the first and last years of the middle school education in Turkish Education System. These two age groups were chosen with respect to the Piagetian development periods indicating concrete operational and formal operational stages so that this study can provide some implications on middle school students which might differ from each other socially and cognitively (Rejeski, 1982).

Secondly, since the place of residence of children is regarded as a factor for a significant influence on the children's conceptualization of natural environment (Collado et al., 2016), it was set as another criteria for selection of the participants. According to Wals (1994) and Pointon (2014), there can be seen differences in the students' perceptions of nature and human-nature relationships in regard to proximity to the inner city or countryside of where they live. To avoid seeing this difference in the present case study, middle school students who live in a city-center were selected as the participants. In this way, it was aimed to be create well-formed and focused boundaries and to provide information for a particular group of individuals who live in a city-center, rather than distinguishing differences between locational context as inner-city and country-side.

In addition to these selection criteria, since the data were collected after the first case of COVID-19 was recorded in the world, it should be noted that the participants of this study did not experience COVID-19 infection in their family or in their own physical and social environment for that time.

With the advancements in the information and communication technologies, several digital tools and applications for conducting interviews on-line are offered

(Archibald et al., 2019). Digital technologies and applications for communication, Internet access and electronic devices played a significant role for the present study. An innovative video conferencing platform was used during the data collection in this study. These kinds of video conferencing tools are considered as research tools which have unlimited potentials and benefits for qualitative interviews such as being able to interview geographically varied individuals, to schedule for convenience of participants and to record the meetings effectively (Sullivan, 2012). The students' accessibility to Internet and having electronic devices (i.e. computer, tablets or smartphones) were checked before the main study.

3.2.3 Natural Setting of the Study

The students who participated in the study live in Ankara, which is the capital city of Turkey, located in the Central Anatolia Region. Due to its location, Ankara is a shoreless city. According to Ankara Development Agency (2018), green area per person in Ankara was found as 19.72 m², while across Turkey green area per person was calculated as 6.08 m². Considering the specific natural areas, while forestland constitutes the 18% of total area of Ankara, total number of urban forests found in Ankara province reported as six (General Directorate of Forestry, 2019). Additionally, there are fifteen recreational spots found in Ankara where people can enjoy, relax, go for a picnic and generally has green area (General Directorate of Forestry, 2019). Ankara can be considered as an industrialized city, since distribution of industrial enterprises, like small companies in organized industrial sites or high-tech companies, shows resemblance with the average of Turkey (Ministry of Industry and Technology, 2018; Ankara Developmental Agency, 2018).

3.3 Data Collection

According to Yin (2011), qualitative studies should use multiple sources rather than only one source in order to collect data. Multiple sources that helps qualitative researchers to collect in-depth data can be listed such as interviews, observations, visual materials (Creswell, 2007). For these reasons, in the present study, semi-structured interview was conducted as the main data collection tool, while guided-imagery technique, drawings by using draw and explain technique and cards for images of relationship were employed as supportive data collection tools.

3.3.1 Data Collection Tools

The purpose of the study was investigating the middle school students' visions of nature that includes their images of nature, values of nature and images of relationship. To understand and interpret views of people on a specific subject, in this case 'nature and HNR', views that people hold should be revealed with the help of the creative and different tools such as drawings with oral explanations (Alerby, 2000).

In line with this aim, semi-structured interview was used as the main data collection tool, while different techniques such as guided-imagery, draw-and-explain and card selection were also employed as three different supportive tools to examine visions of nature of the participants. In order to be clearer how data was collected by using which tool and for answering which of the research questions, data collection tools of the present study were provided in accordance with the research questions in Figure 3-3.

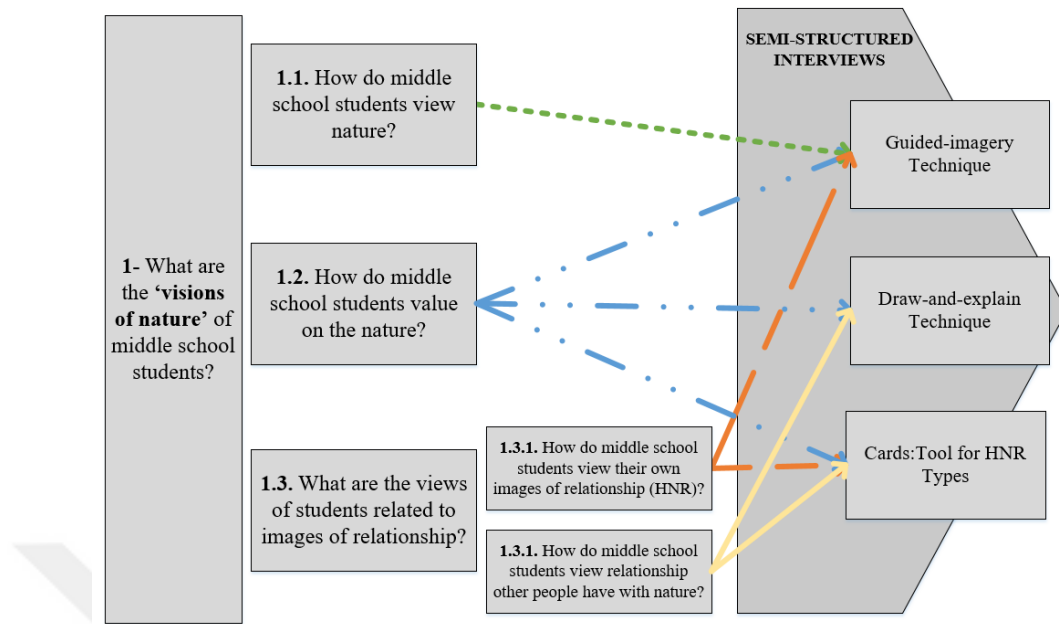


Figure 3-3 General Model of Data Collection Tools in accordance with Research Questions

As seen from the Figure 3-3, the research questions were investigated by conducting one-to-one, semi-structured interviews but the data were enriched by supporting with the different supportive tools and tasks such as “guided-imagery technique”, “draw-and-explain technique” and “cards for HNR types”. Semi-structured interview and the supportive data collection tools were explained in the following sections.

The summary of the data collection tools and in what purposes they were used in the present study can be found in the following Figure 3-4.

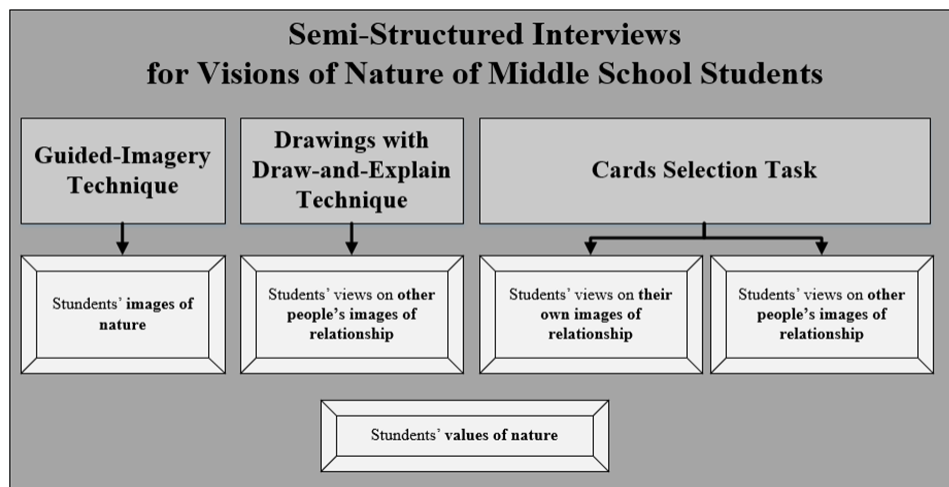


Figure 3-4 Summary of the Data Collection Tools

3.3.1.1 Semi-Structured Interview Protocol: For Images of Nature, Values of Nature and Images of Human-Nature Relationship

Since this study was carried out by following qualitative research design, the main data collection tool was the semi-structured interviews. According to the Merriam (2009), interviews are necessary to understand people's interpretations of world around them. Thus, throughout the research, semi-structured interview protocol was implemented in order to investigate views of middle school students toward nature and human-nature relationship deeply while utilizing different techniques.

Semi-structured interview protocol (Appendix B) was composed of ten demographical background questions and sixteen questions for the views of nature and human-nature relationship of students. These questions were prepared by reviewing related literature.

Interview protocol was divided into three parts, which was supported by different supportive data collection tools. In the first part, children were asked to express their views of nature with the help of the 'guided-imagery technique'. The first task was

presented to students as “Nature Trip in Minds” to make them share their images of nature. In the second part, questions were directed to students in order to investigate their views on relationship of other people have with nature. These questions were supported with drawing task named as ‘Draw Humanity’s Relationship with Nature’ by using ‘draw-and-explain technique’. As the last part, two main questions and supporting questions were asked to examine (i) views of students regarding their own images of human-nature relationship and (ii) views of students regarding images of relationship of other people. These questions in the last part were presented to the students as the third task called ‘Card Selection’. Several cards were shown to the students that provides visuals and texts related to different types of human-nature relationship to investigate their images of relationship under two point of views.

On the other hand, values of nature were also analyzed from the responses of students taken out of the interview questions. There were no additional task or supportive tool were used to detect values of nature, rather questions asked in the semi-structured interviews helped to uncover values of students hold for nature.

3.3.1.1.1 Guided-Imagery Technique: For Images of Nature

In order to examine images of nature of students, guided-imagery technique was used in the first task called as “Nature Trip in Minds”, while supported by the semi-structured interview questions. According to Galyean (1981), definition of guided-imagery technique depicted “...as a set of structured mental-visual exercises that enable one to perceive clearly various aspects of one’s personality, both on the conscious and subconscious levels of being (Galyean, 1981, p. 57).”

Usage of guided-imagery in the educational context is not new (Galyean, 1981). Guided-imagery has an effect on both elementary and secondary school students that with the imagery activities students are developing both cognitively and affectively (Galyean, 1982). With the usage of guided-imagery in educational context, it is known that (i) the attention and focusing of students on a given subject sharpens, (ii) students understand and perceive the certain academic disciplines and skills, (iii)

students enhance skills like “introspection, reflection and understanding of personal symbology” and (iv) “communicate with others through mental images and sensations” (Galyean, 1982, p. 65; Galyean, 1981, p. 57). Teachers use this technique in the lessons in order to make students focus on the subject by relaxing them (Galyean, 1981).

When taking into account the definitions and usage of guided-imagery in education, it was considered as the best technique for the present study. In this way, it was aimed to make students relaxed, communicate with the researcher and reflect their nature views with the researcher easily. Directions of the first task called as “Nature Trip in Minds” were explained to the students to make them informed about what they will do, to make them feel comfortable and talkative, to encourage them stimulate their imagination (Rios & Menezes, 2017) , to implement the interviews and tasks in a funny way for them from the beginning of the study.

Before the first task, some demographical questions were directed to the students from the semi-structured interview protocol. To serve the purpose and encourage students to participate to the task, the participants were asked questions as in the followings: “*What do you understand when say “nature” and “being in nature”?*”, “*If you spend time in nature before, can you share with me those times?*”, “*What does it feel to be in nature? What kind of emotions do you have towards nature?*”. After these questions, task for understanding students’ views of nature was started by the researcher and the participants were wanted to imagine themselves in nature.

As the requirement of the guided-imagery, students were asked to close their eyes and think about what they visualize in their minds when said ‘nature’ and ‘what they do in the nature’. Additionally, a soft instrumental background music was put on during the first task. With this way, it was aimed that the students become relaxed with the soft background music because it is stressed that playing a soft music directed students to have a pleasant relaxation (Galyean, 1982) and they were stimulated to go on a nature trip in their minds easily (Rios & Menezes, 2017).

Additionally, in order to make students feel comfortable and use the guided-imagery technique in an appropriate way, researcher wanted from participants and sit in a comfortable position, to take breathes for relaxing with a combination of soft, relaxing background music. With a calming environment created by researcher and the applied requirements for using guided-imagery technique, it is aimed to evoke students' visualization skills and to explore students' own worlds related to nature (Rios & Menezes, 2017).

The directions and usage of technique were adapted from Rios & Menezes (2017, p. 1405). The direction of the first task, which was provided to the students presented below:

"Let's take a nature trip with you from where we sit, in our minds. I am putting on a soft background music. Can you hear it?"

Let us close our eyes. Relax in your seat... If you want, you can put your hands on your tummy, you can inflate it with your breath. Let's take a deep breath and exhale... Inhale and exhale... Now I want you to imagine yourself in nature while doing something. This can be a place you've been to before, wanted to go, or created entirely out of your imagination. So, take a deep breath, hear the soft music playing background and feel relaxed... I am leaving you alone with your own imaginery nature trip to think calmly."

During the imaginery, after a certain period, some questions were directed to students -such as "What do you see?", "What kind of place do you imagine?", "What sound do you hear?", "What are you doing now?" "Can you tell me, what kind of species did you see in your imaginery?", "Is there somebody else in your imaginery?", "How do the species you see interact with each other?", "Why do you imagine a place like that?", "How do you feel in the place you imagined?", "Is something bothered you?"- while their eyes were still closed in order to make them maintain imaginery process.

After the imaginery visions, the students were wanted to stretch their arms and open their eyes. They were asked further questions by researcher in order to gain more in-depth and detailed information related to their perceptions of nature. After students

finished imagining the nature trip in their minds and if necessary, additional further questions were asked, the second task was started by the researcher.

3.3.1.1.2 Draw-and-Explain Technique: For Images of Relationship

Draw-and-explain technique can be defined as a diagnostic method that helps to understand opinions of the students and their way of shaping concepts (as cited in Ozsoy & Ahi, 2014). In educational context, draw and explain technique was also used to examine views of children (Ozsoy, 2012; Ozsoy & Ahi, 2014; Shepardson, 2005). For this reason, as a second task and supporting data collection tool for the semi-structured interview, draw-and-explain technique was used in this study to examine students' views on other people's relationship have with nature. Students' drawings were supported with the semi-structured interview questions because it is aimed to help students who cannot draw properly and cannot reflect their opinions because of lack of drawing skills.

As students' views reflected on the drawings were generally seem as representative of their thoughts (Ozsoy & Ahi, 2014), which was aimed to be explained in the present study, students are requested to draw what comes to their mind when said 'relationship between humans and nature'. Students were encouraged to introduce the names of the elements they drew, the roles of the elements in the drawings and reasons of why they drew the elements for easing the analysing procedure by obtaining comprehensible data.

On top of the benefits of drawings, some researchers stated that drawings are subjective and difficult to assess as data collection tool (as cited in Flowers et al., 2015). To reduce this concern in the present study, a rubric for coding of the drawings was used. Since the coding rubrics provides evaluating different aspects in the drawing, it makes the study more reliable and easy to evaluate (Flowers et al., 2015). In brief, with the help of this supportive data collection tool, researcher can understand what the children actually view about the humanity's relationship with nature.

3.3.1.1.3 Cards of HNR Types: For Images of Human-Nature Relationship

As a last part, as the third supportive tool called as “Human-Nature Relationship (HNR) Types: Card Selection” was employed to the participants in order to investigate (i) views of students about what their own HNR types are and (ii) how they view other people’s types of HNR. This part was also carried out with the help of the semi-structured interview questions. There were two main interview questions that directed towards the students in the third task.

For this task, the human-nature relationship (HNR) types that adapted from existing literature were picturized according to the narratives provided by Braitto et al. (2017) and van den Born (2008). These narratives of types were revised and prepared as thought balloons in order to make the students understand the types of HNR easily. Besides, there are several reasons behind picturizing and presenting thought balloons of HNR types. First, these cards were created for an age-appropriate tool, because these types were studied with adults in the literature mainly. Moreover, students may be unwilling to participate and concentrate on the surveys that makes them to read a lot; for this reason, creative implementation ways such as visual-aids for representing students’ own views should be used for young ages (Flowers et al., 2015). By considering this information, types of HNR were picturized to give visual cues to the students, which helps students to reveal their spatial intelligence and in turn, help them to communicate more easily by decreasing cultural, linguistic and social barriers for expressing themselves freely (Flowers et al., 2015).

Seven typologies of human-nature relationship (HNR) and their explanations which were adapted from the existing literature (van den Born, 2008, p. 88; Braitto et al., 2017, p. 373; Li & Ernst, 2015) can be found in the following Table 3-3. According to these explanations, pictures were prepared and thought balloons in the cards were organized and presented. The pictures of HNR types were picturized by an illustrator who has a bachelor’s degree in industrial design in Fine Arts Faculty of Mimar Sinan Fine Arts University. The whole card selection tool that includes pictures and narratives of HNR types can be seen in the Appendix-A.

Table 3-3 HNR Types and Their Narratives

HNR Types	Explanations and Characteristics of Types
Master	They perceive themselves as superior over the nature. They think they are allowed to do with nature whatever they want with technological developments and money. They benefit from nature for their own profit. In this way, they solve the problems (van den Born & de Groot, 2009; Braito et al., 2017).
Steward	They perceive themselves as the protectors of nature. They think that they have responsibility to take care of nature and they owe responsibility to God, future generations or other livings. They think their actions may have an impact on nature. They prefer to use technology for the welfare of nature to minimize the negative effects on nature (van den Born & de Groot, 2009; Braito et al., 2017).
Partner	According to person with Partner typology, nature and humans stands equally. To benefit both, humans and nature should work together. To them, technology should be used where both people and nature will benefit (van den Born & de Groot, 2009; Braito et al., 2017).
Participant	They feel strong affection towards the nature both physically and emotionally. In their opinion, they do not have the right to use technology to make changes in nature (van den Born & de Groot, 2009; Braito et al., 2017).
User	They perceive that nature is the supplier of products for their needs. They think that they have the right to use technology to improve the quality of these products and services that nature offers us. They are trying to conserve natural products while they meet their needs from the nature (Braito et al., 2017).
Apathy	They think that nature has no place in their life. They do not need nature to survive. They do not care the nature not consider the welfare of the nature. In their opinion, there is no need to give too much attention and importance to the nature (Braito et al., 2017).
Nature Distant Guardian	They think that they can protect nature without being interaction with nature. Behaviors like feeding pets at home, sharing posts related to protecting nature through social media, not throwing litter, saving energy are enough for them to protect nature. They can be a part of nature without leaving city life with the help of the environmentally friendly lifestyle (Braito et al., 2017).

3.3.2 Pilot Study

The pilot study was carried out in order to check the instruments and make preliminary preparation before the main research was started. In the scope of pilot study, it was aimed to find out;

- (i) whether the quality, clarity and comprehensibility of the questions in the interview protocol are applicable and appropriate for the age levels of middle school students or not,
- (ii) whether pictures and thought balloons prepared for the third task called as Card Selection are understood by the students clearly or not,
- (iii) whether the planned time for drawing task and interview was applicable for the middle school students.
- (iv) whether the tasks involved in the study interfere with each other or not.

In addition to the goals presented above, researcher had a chance to gain experience and skill related to how to conduct an interview and manage the drawing sessions and to see in which parts her skills should be developed, before conducting the main study.

The sample of the pilot study was comprised of middle school students living in a city center. As in the main study, pilot study included three main tasks, which were supported by the semi-structured interview questions.

In order to manage time in the main study, researcher kept time for each task to be sure that student do not feel bored during the main study. While first task lasted approximately 15 minutes, drawing task –as a second task- varied from student to students according to their situation of interest in drawing; however, in average, drawing task continued approximately 20 minutes. Lastly, third task lasted approximately 20 minutes in the pilot study. There were not observed any bored and distracted students. Moreover, there was not detected that tasks affected each other.

To illustrate, students' imagery related to the nature did not affect their perceptions towards humanity's current relationship with nature. While the participants of the pilot study visualize a very peaceful place and natural setting in their imagery during the first task, these imaginaries did not affect their drawings that reflect the views related to the humanity's relationship with nature. Students can separately reflect their views for two different unit of analyses.

Tasks were supported by the semi-structured interview questions in order to make more meaningful and clearer interpretation out of gathered data. Nature views of the students were examined by the guided-imagery. They were made to close their eyes and imagine themselves in nature. Students were also asked to explain their drawings to gain in-depth information related how they see human-nature relationship in today's world. Moreover, explanations and comments of the students in relation how they interpret pictures of human-nature typologies in the cards, what they see, understand and infer from the picture itself were examined. Additionally, the words and sentences in the thought balloons were asked to the students whether they understand the statements clearly and the thought balloons are compatible with the pictures of the HNR typologies or not.

Pilot study was conducted because it provided benefits for the main study. As a result of the pilot study, not major, but minor revisions were required especially for the interview protocol and for the cards in the card selection task. Semi-structured interview protocol was revised such that new questions were added in order to gain more information and one of them were excluded from the protocol. In the questions of first task, it was asked '*Did you put yourself into your imagery?*'. However, as students themselves visualize the dream, this question was excluded from the protocol for being unnecessary. Moreover, in the second task, a question was added for the students who did not draw themselves. The students were asked '*Where and how would you draw if you draw yourself?*' to understand how they view themselves into relationship with nature as an additional evidence.

Apart from the interview questions, the pictures and thought balloons in the card selection task were revised as well. Revisions of the pictures and thought balloons were done according to the views of participants and opinions of field experts who study human-nature relationship. As a result, with both of the feedbacks that come from the students' responses in the scope of pilot study and opinions of field experts, pictures and thought balloons were revised.

In general, feedbacks came from the students were the minor unclear elements in the pictures and some words used in the thought balloons because they do not know the meaning of the words. For these incomprehensible points, new and substitutable words were used without lost the main idea. To illustrate, one of the students did not understand the sentence in the Master typology: *'I can do all kinds of interventions to nature to protect myself.'*, because he did not know the meaning of *'intervention'*. Therefore, the sentence was revised as *'I can use nature to live the life I want and to protect myself.'* In addition, another student did not understand the phrase *'co-constitute the self'* in the sentence of Participant type *'...I feel like this bond with nature co-constitutes my self.'* Therefore, it was revised like *'...This bond is very important to my character / personality'*. The word *'self'* was too abstract to understand; thus, the words such as *'character and personality'* were used instead, because students were more familiar with these words. Some of the students had difficulty in understanding while reading the sentence in the Participant type that is *'We do not have the right to use technology to make changes in nature.'* therefore, this sentences was converted as *'We should not use technology to change nature.'* Another student emphasized that he did not know the meaning of *'threat'* in one of the sentences in the Stewardship typology. Thus, the sentences is revised like *'People can sometimes become a danger to nature and technology can be used to reduce these dangers'*, so instead of *'threat'*, the word *'danger'* was used.

Apart from the minor alterations in words and sentences, some of the students affected by the unclear elements in the drawings and facial expressions of the characters in the typologies. In order not to create biased selections of typologies and not to cause misunderstandings, unclear parts of drawings were also revised. To

illustrate, most of the students do not understand drawings that represent the industrial buildings such as cooling towers and oil and gas flares. They generally misunderstood their visual functions in the pictures. Some of them called cooling towers as volcano in the pictures of all typologies; some of them questioned what the flare is. As a result, all incomprehensible elements in the pictures related to industry deleted and familiar factory visuals or the oil barrels were placed, instead.

Additionally, elements in the Apathy type such as rubbish on the ground, dead fishes near the river and flames on the trees could not be understood clearly; therefore, these elements were drawn again in a more understandable manner. Furthermore, facial expressions of the characters –especially in the typologies such as Participant, Master, Nature Distant Guardian- revised, since some of the students were inclined to select the prettiest girl in the pictures such as girl in the Participant or not selecting the picture because the man was angry. To add, some of the students evaluate the typologies by comparing only the pictures of typologies and saying that ‘This is a bad guy because he is angry, this is a good character because she is smiling and is beautiful.’ To prevent these type of biased decisions toward typologies, facial expressions and accessories of characters were neutralized and stabilized in the drawings.

In addition to the corrections received from ideas of students, invaluable opinions and suggestions were taken from the experts in the subject of human-nature relationship and typologies. They proposed general and specific opinions both for the pictures of typologies and their explanations in thought balloons. One of the general comments received from experts was trying to use same characters and elements in the drawings. The other comment was to add renewable technologies into the pictures to make pictures more realistic. As they suggested to add renewable energy sources, wind turbines were added to each typology.

One of the major revision was done for the Master typology. Although experts appreciated the idea of people having money and gear wheels in their hands, they recommended visualizing humans stand above the nature as two separate entitites.

Besides, although they liked the way of expression of Master type with oil flares; they thought it could be too dominant in the drawing. By taking into consideration all of these opinions and opinions of students from pilot study, humans were drawn as separate entities from the Earth and stand above the nature and the oil flares were deleted. The pictures of Master type before and after the expert opinions can be seen in the Figure 3-5.

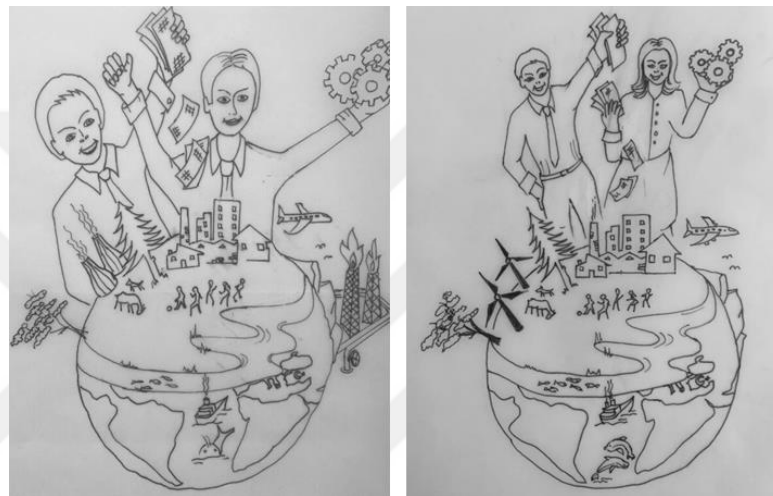


Figure 3-5 Revisions of Master Typology (from left to right old version, new version)

Another major revision was for the Partnership type. Although experts appreciated the picture –especially idea of the hand in hand of the species- in conveying the whole idea related to the Partnership, they stated that picture do not completely reflect the ideas of ‘working together’ and that ‘nature and humans benefit from each other’. For this reason, in the middle of the picture, it was added a human figure while watering a tree and tree provide shelter, fruit and shadow for protection for humans. In this way, mutualistic relationship between humans and nature was tried to be reflected. The pictures of Partnership before and after the expert opinions can be seen in the Figure 3-6.

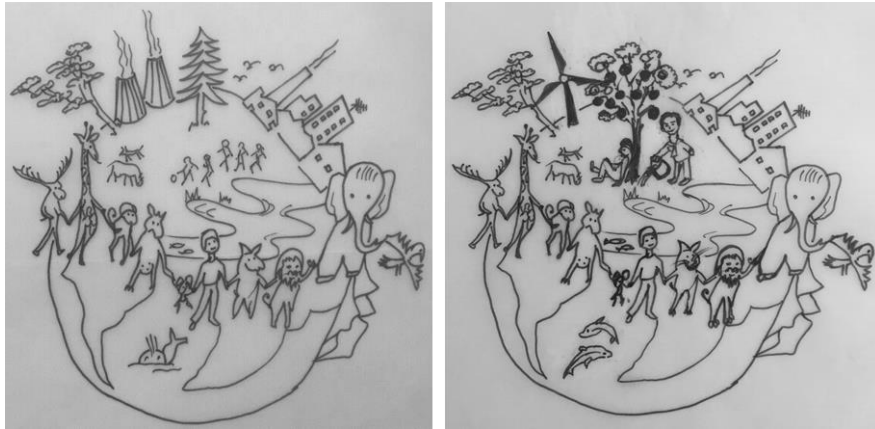


Figure 3-6 Revisions of Partnership Typology (from left to right old version, new version)

Lastly, experts were commented on the Participant type. They stated that the picture reflects the idea of Participant type very well; however, deleting all of the humans and human-made things go extremes and including them would be more realistic. Therefore, humans and human-made elements were added to the picture of Participant type. The pictures of the Participant type before and after the expert opinions can be seen in the Figure 3-7.



Figure 3-7 Revisions of Participant Typology (from left to right old version, new version)

Additional to the suggestions for pictures, experts commented on the explanations in the thought balloons, too. To illustrate, in the explanation of the Participant it was indicated a sentence like *'I feel like I'm part of nature.'* However, experts suggested using sentence like *'I am part nature.'* as the way of 'feeling like part of nature' and 'being a part of nature' have different meanings from each other. Besides, they criticized that the *'nature co-constitutes my 'self''* sentence by saying that the concept of 'self' may be difficult for the age-group, which is resulted like in the pilot study. They suggested to use sentence like *'The bond I have with nature is very important for who I am/ for my character.'* Since in the explanation of Stewardship type there were religious connotations and picture did not reflect these meaning, experts appreciated how these religious elements were avoided in the picture and text; however, they suggest asking further questions in the interview related to this aspect of Stewardship.

To sum up, revisions were done with the help of the comments and suggestions received from the participants of the pilot study and opinions of experts. Both of the pictures of typologies and their explanations were corrected and prepared to make suitable for age level of students and to collect data for main study.

3.3.3 Data Collection Procedure

In order to investigate middle school students' visions of nature, one-to-one semi-structured interviews with some supportive tools were conducted by the researcher. Before the main study was conducted, ethical approvals from Ethics Committee at Middle East Technical University (Appendix C) and the necessary permission from Ministry of National Education (Appendix D) were gathered for the administration of the final version of the instruments. The administrators of the schools were visited and informed about the purpose of the study and data collection tools. The researcher had a contact with the parents of the participants to explain the content of the study. Informed consents of both the parents and the participants were obtained. Then, time schedule for the interviews was planned by considering convenience of the

participants. Interview schedules were prepared by the researcher with a maximum of two meetings per day in order not to create fatigue for both the participants and the researcher.

After a brief introduction of the study and getting acquainted phase, demographic questions were posed to the participants in order to know them well. Furthermore, it was stated that there were three tasks to be performed with them and the first task was started by the researcher.

For the first task called as “Nature Trips in Minds”, students were wanted to close their eyes and imagine themselves in nature while doing something. A soft background music was turned on in order to make them feel relaxed and engage them to the activity for creating an environment for sharing their imaginery easier. In this way, their perceptions of nature were tried to be identified. During imaginery of students, interview questions asked and students explained what natural setting they see, what species they see and interact, what they feel and what they are doing. The first task lasted maximum 10 minutes in average. After a nature trip in the minds, the students were wanted to open their eyes, stretch their arms and asked how they feel. If they feel comfortable and feel good to continue, researcher carried on with the second task.

For the second task called “Draw Humanity’s Relationship with Nature”, the students had an empty A4 paper sheet and colorful pens, which may enhance the quality of the drawing. The directions of the second task were explained by the researcher as in the following:

“Now, we are come back to real life from our imaginary nature trip. I want from you to draw a picture related to humanity’s relationship with nature. Let us chat about this topic. Then, I want you to draw what you think about the relationship between humans and nature.”

Drawing session lasted 20 minutes on an average. At the beginning of this task, students were made relaxed by indicating that it is not important how they are skillfull in arts, how they draw; rather, it is emphasized that the important thing is what they think while they drawing. After students completed their drawings, they

were asked to share their drawings and were requested to explain what they drew. Interview questions regarding students' views on other people's relationship with nature were asked to the students. With the guidance of the questions, explanation phase of their drawings were simplified and students easily expressed themselves according to the directed interview questions.

As a third task, "Card Selection", reflecting HNR types, was started in order to identify students' images of human-nature relationship. The students were allowed time for each card both for examining the pictures and reading the explanation of the HNR types. For each card, they made their own comments. Participants were asked what they think about the picture and thought balloon, whether they are agree or disagree with the given thought balloon or not. Students were requested to select type(s) that best explain their ideas about appropriate relationship with nature and best explain other people's relationship with nature in today's world.

3.4 Data Analysis

In qualitative research, data analysis was considered as a procedure that carried out by the researcher from the beginning of the data collection in order to make sense out of the collected data (Merriam, 1998, 2009) and as a "process used to answer the research question(s)" (Merriam, 2009, p. 176). According to the Fraenkel, Wallen and Hyun (2012), qualitative data analysis, by its very nature, is inductive, iterative and comparative procedure which data are continuously retrieving from the participants, and researcher are reducing the written and visual data into the meaningful pieces of information. On this basis, in this study, data analysis was done in an inductive way. Yet, coding rubrics were adapted to the present study and these rubrics benefited the coding process both inductively and deductively to increase the dependability.

According to Merriam (2009), although there were some basic strategies proposed for the qualitative data analysis, some characteristics should be taken into consideration for data analysis of case study. Since a case study is "an intensive,

holistic description and analysis of a single, bounded unit” (Merriam, 2009, p. 203), all data for the case study received from tools like transcripts, drawings, records, analytical and reflective memos of researcher should be gathered together during the analysis procedure (Merriam, 2009). As the research design of this study is a case study, considering these definitions, data were examined and interpreted holistically as all of the data tools were used to support components of visions of nature. To be more specific, while the students’ own views on types of HNR were analyzed mainly by using third task called “Card Selection”, some supporting evidences were also taken from the interview data of first and second tasks. In order to achieve this, data should be organized to allow researcher to focus on the specific information among the rich data set (Merriam, 2009).

As several indications on visions of nature of middle school students were investigated with different supporting tasks in the study, different coding rubrics were adapted for each tasks from the related literature for coding and categorizing the data appropriately and to make the data analysis procedure more trustworthy. On this basis, Schreier (2012) mentions that to systematically making meaning out of data, qualitative content analysis can be used as a method of analysis because it provides to specify and focus on the certain aspects of data among the voluminous data set, which also made data of the present study more easy to analyze for each different task. Additionally, qualitative content analysis can be employed on several types of data like interview transcripts, visual data like films, photopgraphs and drawings (Schreier, 2012; Mayring, 2004). Moreover, qualitative content analysis help to quantify the qualitative data by counting the codes and their frequencies (Vaismoradi, Turunen, & Bondas, 2013). To add more, qualitative content analysis used both inductively and deductively (Elo & Kyngas, 2008). Due to these reasons, in order to organize and reduce data for reaching meaningful pieces of information, to quantify the qualitative information when needed and systematically interpret the different type of data come from different tools, qualitative content analysis was employed in this study. Quantifying qualitative data was benefited in the present study, because students’ own view on appropriate relationship with nature and their

views regarding types of other people's relationship with nature were decided in terms of what was mentioned more frequently in the interviews and drawings of students. Although there were no strict and systematic rules for content analysis (Elo & Kyngas, 2008), for the study, main phases of content analysis were adopted such as preparation, organizing and reporting phase of content analysis proposed by the Elo and Kyngas (2008, pp. 109-110).

First of all, for the preparation of data analysis, units of data analyses were selected to correspond and to answers the the research questions. Interview data that were transcribed under the headings of three tasks that helps to analyze four embedded-units of analyses called as (i) images of nature, (ii) values of nature, (iii) students' own views on images of relationship, and (iv) students' ideas on other people's images of relationship.

Throughout the study, data analysis was assisted by the usage of Computer Assisted Qualitative Data Analysis Software (CAQDAS). To be more precise, one of the widely used programs called "MAXQDA 2020" (Yin, 2011) was used in the data analysis process. MAXQDA 2020 is a member of CAQDAS family, which is a computer software program that makes possible to analyze qualitative data easier (Kuckartz & Radiker , 2019). However, it is worth to point out that as Bogdan and Biklen (2007) stated, CAQDAS, as the name suggests, do not conduct the analysis instead of researcher, but it helps researcher by assisting, organizing and categorizing data.

For the preparation phase of analysis, audio records of students were made verbatim transcription immediately after the interviews completed in order not to forget about students' tones in the answers and their gestures while talking with the help of the MAXQDA 2020. As stressed in the literature, for the analysis the whole interview data was more suitable because interview protocols were large enough for reaching a rich data related to the case and small enough to conclude the meaning out of retrieved data.

Afterwards, for the organizing phase, the interview data come into prominence. Accordingly, the coding process was started in an inductive way. As a first cycle, open (initial) coding was conducted in order to be open to everything that may emerge from the data (Merriam, 2009; Saldaña, 2013). According to Saldaña (2013), open (initial) coding is appropriate to use for beginning qualitative researchers as a starting point because, in this way, researcher can realize easily the direction of the study. To achieve this in the study, from the transcript scripts of each student, important phrases or words was detected and highlighted in different colours that is related to the (i) images of nature, (ii) values of nature and (iii) images of human-nature relationship. In this way, any relevant data from the transcription were broken into pieces as a unit of data (Merriam, 2009) and it was made possible to organize codes. MAXQDA 2020 was used in organizing process by colouring the phrases differently.

Since there were coding rubrics for each different task, in order to support the codes emerged from open coding, second cycle coding was conducted in order to reorganize, recode and reanalyze the coded segments taken out of the first cycle (Saldaña, 2013). This time, patterns from phrases and additional codes were reorganized and grouped. New codes that emerged from the data inductively were added to the adopted rubrics by considering the features of building and adapting coding frame proposed by Schreier (2012). In this step, since the rubrics were adapted from the literature, existing coding frames benefited to the process of categorization deductively. Lastly, the codes were gathered to create categories, to add or revise codes or to place the phrases and codes into the categories that existed. Coding rubrics for each three tasks were revised and prepared for analysis.

The whole data were analysed by two coders who were the researcher and the graduate of master's degree in the field of science education and interested in human-nature relationship subject. Second coder was invited to the study in order to increase the credibility and dependability of the interpreted data. Both coders examined and read the transcripts and coded individually. Later on, codes from different coders were compared to see the similarities and differences. As a last step, inconsistencies

were discussed by the two coders. At the end of the discussions, with the mutual consent, the codes and categories were decided.

In order to calculate the intercoder agreement (interrater reliability), the formula suggested by Miles and Huberman (1994, p. 64) was used. Miles and Huberman (1994) propose that coders should agree on the 95% of codes and categories of data with at least 80% agreement between each other. By considering these criteria, two coders checked all the data set, which are the codes and categories of transcripts of all participants. In a word, 100% of codes and categories were controlled. According to the formula of Miles and Huberman (1994), interrater reliability (IRR) was calculated as 92%, which is sufficient for support that the present study is dependable.

In summary, as a main data collection tool, semi-structured interview data were analyzed with the help of the qualitative content analysis method. Interview data were interpreted and results were presented with the help of the three supporting tools and related tasks called as “Nature Trip in Minds”, “Draw the Humanity’s Relationship with Nature” and “Card Selection”. In this way, four main units of analysis for three components of visions of nature that are (i) images of nature, (ii) values of nature (iii) views of students towards appropriate human-nature relationship and (iv) views of students towards the other people’s relationship with nature were investigated with the help of the related coding rubrics. These rubrics used during the activities were presented in the following sections. Addition to the general data analysis of interview protocol, how tasks were analyzed with the aid of rubrics were explained in detail.

3.4.1 Coding Rubric for ‘Nature Trip in Minds’ Task

For three different tasks that help to collect data related to each unit of analysis, different rubrics from the literature were adapted to this study. For the first task called “Nature Trip in Minds”, which was completed by guided-imagery technique and enable to examine how students view nature, rubric was used by adapting the

categories and sub-categories emerged from both Rios & Menezes (2017) and data from interviews. Since study of Rios & Menezes (2017) focuses on the early childhood students, depending on the codes that retrieved from data, some modifications were done and categories and codes developed from data were added to the coding rubric in the light of interview analysis.

Nature images of students analyzed under four different categories named as natural setting, natural species, materials and activities in nature and feelings in nature.

In the natural setting category, how students visualize a place when said nature was tried to be examined. There were three sub-categories under the natural setting categories as 'inside or outside', 'real or mythical' and 'closeness to city center'. In the 'inside or outside' sub-category, students were investigated whether they perceive nature as a place where is outdoor like forests, dunes or is an indoor place like a house, a building. Although there were existing two categories in the adapted rubric as inside and outside, in this study, students visualize themselves under one category which is natural places as 'outside'. In the 'real or mythical' subcategory, it was examined whether students visualize a place that really exist in the real life or they visualize a place that is not seen in the real-life such as magical landscapes. Lastly, natural setting was examined by considering whether the place students imagined is close to city centers or away from the city centers and crowded places such as wilderness.

In the natural species category, there were analyzed two additional sub-categories as 'kind of species' and 'role of species'. These two sub-categories were examined both to understand what kind of species they view when said nature and how they relate with the species they visualized in their imaginery. Their views that assigned to the role of species were also examined for their HNR typologies and how they perceive their relationship with nature.

For the activities and materials in nature category in the coding rubric, there were examined two sub-categories such as 'kind of materials' and 'kind of activities'. While examining the kind of materials, it was aimed to understand whether students

spend their times in nature by using human-made materials (i.e. buildings, technological devices) or natural materials (i.e. branches, trees, water).

One of the added sub-categories was the kind of activities which is coded as “consumptive” and “non-consumptive” activities. It was analyzed whether the students imagine themselves in nature by doing consumptive or non-consumptive activities to make inferences and interpretations related to their views of nature and at the same time, what their own views on appropriate relationship of humans with nature are. According to Duffus and Dearden (1990), between human recreation and habitats, humans interact with nature by non-consumptive and/or consumptive ways. While consumptive activities were exemplified as hunting, eating, activities that harm wildlife; non-consumptive activities were exemplified as birdwatching, observing nature, walk in nature (Duffus & Dearden, 1990).

As a last category, feelings were added to the coding rubric in order to understand how students feel in the nature to examine the views of the students towards natural environments and to interpret their relationship with nature clearer from their affective development. In the category of feelings, there were two codes emerged as positive and negative. The whole coding rubric that was used during the analysis of first task to examine nature views of students with the aid of the qualitative content analysis data analysis.

Since the qualitative content analysis helps researchers to focus on a specific aspect of the study (Schreier, 2012), data retrieved from the interview of first task was analyzed with the help of the coding rubric shown in the Table 3-4.

Table 3-4 Coding Rubric for 'Nature Trip in Minds' Task

Categories	Sub-Categories	Codes	Explanations of Codes
Natural Species	Kind of species	Wild/ Unfamiliar	Species that is not seen in the city center (i.e. lion, bear)
		Familiar	Species that familiar and come across in city center (i.e. cats, dogs, birds)
		Mythical	Species that are fantastic which is fictionalised by participants. (i.e. magical flowers)
	Roles of species	Positive	Species are perceived as peers of humans (i.e. playing with them, spend time with them)
Natural Setting	Inside or Outside	Negative	Species that were used for human-usage (i.e. hunting)
		Not mentioned	Does not mention about the role of species in imagery.
		Inside	Describing a inner place when imagine themselves in nature (i.e. house)
		Outside	Describing nature as an outside place (i.e. forests, greenery)
	Real or Mythical	Real	Places can be seen in the real life. (i.e. forests, gardens)
		Mythical	Places that are fictionalised by students. (i.e. fairylands)
	Closeness to city center	Close to city center	Places that students can easily visit, close to place where they live (i.e. forest, garden)
		Away from city center	Places that far away from the city center and distant from crowd of faces (i.e. Amazon forest, village, beach, virgin nature)

Table 3-4 (cont'd)

Categories	Sub-Categories	Codes	Explanations of Codes
Materials & Activities	Kind of materials	Natural materials	Materials from nature used in the imagery (i.e. tree branches, pine cones, tree)
		Human-made materials	Artifactual materials that is imagined (i.e. park benches, buildings, bridges)
		None	Does not mention about the materials used in the place and actively they imagined.
	Kind of activities	Non-consumptive activities	Activities that protect nature without consuming (i.e. observing nature, loving animals, nature walks)
		Consumptive activities	Activities that use and consume resources (i.e. hunting, burning tree branches, picnic, grilling)
Feelings	Feelings of nature	Positive	Feelings toward nature such as peaceful, affection, loving, caring.
		Negative	Feelings toward nature such as scary, uncomfortable.

3.4.2 Coding Rubric for Values of Nature

Values of nature of students were investigated from their answers to the interview questions. In order to categorize and examine which values they have toward nature, approach of van den Born (2008) were adapted to the present study. As in the van den Born (2008), values of nature of students were detected under three main categories which are instrumental, intrinsic and neither instrumental, nor intrinsic values. While instrumental values were related to the importance of nature because of its functionality for humans; intrinsic value was regarded as own value of nature irrespective of its usage by the humans. Neither instrumental, nor intrinsic values, on the other hand, can be indicated as values that cannot be classified under solely one category. Categories and codes of the rubric were adapted from the van den Born (2008) which is presented in Table 3-5

Table 3-5 Coding Rubric of Values of Nature

Category	Codes		Phrases
Instrumental values (Anthropocentric)	For survival		Provide oxygen to breathe
			Keep us alive/survive
			Provide food/water
	For recreation/enjoyment		Have fun in nature
	For future generations		Preserving nature for the sake of future generation
	For health	Physical health	To not get caught diseases.
			Healing better and quickly
		Psychological health	Help us get better psychologically
			Provide calmness, tranquility, getting away from troubles in daily
			Away from stress and city noises

Table 3-5 (cont'd)

Category	Codes	Phrases
Neither instrumental, nor intrinsic	Beauty of nature	Animals and flowers makes nature beautiful. Provide beautiful view
	God's creation	Entrusted to us by God.
Intrinsic values (Ecocentric)	Place of animals and plants (non-human livings)	Nature is home of animals and plants.

3.4.3 Coding Rubric for 'Draw Humanity's Relationship with Nature' Task

For the second task, drawings done by students were analyzed by using qualitative content analysis. In order to understand the codes in the drawings and interviews related to drawings clearly, establish consistency between the codes emerged from drawings and the explanations of students taken out of interview data, the explanations of students about drawings received from interview data and their drawings were examined simultaneously.

The coding rubric was adapted from a part of analysis of Rejeski (1982). One of the categories Rejeski (1982) proposed was the 'Relationship on a specific level' while analysing the drawings related to point of view of children toward the natural environment. The codes emerged from his proposed category was adapted to the present study. The rubric adapted for the drawings related to the views of students towards the other people's relationship with nature was presented in the Table 3-6.

Drawings and their explanations towards the humanity's relationship with nature were analyzed under the specific level of categories which were (i) positive, (ii) negative, (iii) neutral and (iv) differential relationship. Since analysis of drawings and example statements support and provide further evidences for the typologies of humanity's relationship, related typologies can be seen in an additional columns as related typologies.

3.4.4 Coding Rubric for 'Card Selection' Task

The third task called as "Card Selection" was applied to the students in order to examine both their own types of HNR and to investigate how they view other people's relationship with nature. For these reasons, types and definitions of the HNR types were adapted from the existing literature provided first by the van den Born (2008) and expanded by the Braitto et al. (2017). For this task, expanded version of the types and their narratives were used when analyzing the procedure.

For views of students' own relationship with nature and typologies, rubric of Li and Ernst (2015) was adapted and extended with the evidences taken from the interviews of this study. The categories were renamed with the types and some new categories were added. The coding rubric used for the students' own relationship with nature and typologies was presented in Table 3-7 in detail. As can be seen from the rubric for analyzing the students own relationship with nature and their typologies, seven typologies (Master, Steward, Participant, Partnership, User, Apathy, and Nature Distant Guardian) were taken into consideration as the categories. In this way, from the answers of students to the interview questions and selection of HNR types were detected. As the technological aspect were not included in the Li and Ernst (2015), codes related to technology were added to the related categories as the explanations of types adapted from the Braitto et al. (2017) was used as the technological aspect in HNR. Some names of the categories and codes were revised in the adapted rubric in order to be consistent with the explanations of the types.

Table 3-6 Coding Rubric for 'Draw Humanity's Relationship with Nature' Task

Categories	Codes	Example Statements of Codes	HNR Type
Positive Relationship	Protecting nature	Some of the humans behave nature consciously. Some of the humans behave nature well. Some of the humans protect nature. Humans do not throw trash to nature. Humans do not pollute nature. Some humans are nice to the flowers and trees.	Steward
	Appreciating nature	Humans doing sports and playing in nature peacefully. Some of the humans feel the nature/ feel the beauty of nature. Humans listen the sound of nature.	
	Equal benefit	Humans benefit nature, nature benefits human.	
			Participant
			Partner

Table 3-6 (cont'd)

Categories	Codes	Example Statements of Codes	HNR Type
Negative Relationship	Mistreating to nature	Some humans want to ruin nature and behave badly.	Master Apathy
		Humans are cutting trees.	
		Humans grill make a fire in the forests.	
		Humans pollute nature with factory wastes , factory gases, with trashes like glass bottles, wastes.	
		Humans pollute waters (with petroils, plastics).	
		Humans pollute air (car exhaust, grey clouds and sun).	
		Humans cause greenhouse effect /climate change/global warming.	
		Humans distort the balance of ecosystem.	
		Humans disturb the animals.	
		Humans decrease the diversity of the species.	
	Using nature for own profit	Humans use technology to build factories, destroy nature, and produce more and earn more money.	Master
		Humans destroy nature for their enjoyment.	
		Humans benefit from nature for their own profit.	
		Humans are building roads/ buildings/ factories.	
		Humans do not care nature.	
	Apathy toward nature	Some humans think they do not have impact on nature.	Apathy
		Humans pollute nature for carelessly/without considering.	
		Humans do not irrigate grass and flowers.	
		Fruits and flowers are dead because humans do not care the nature.	
		Humans do not interested with the animals.	
	Using nature for meeting needs	Humans do not see that animals are sad.	User
		Humans hunt animals for clothing and food.	
		Humans use trees to make furniture.	

Table 3-6 (cont'd)

Categories	Codes	Example Statements of Codes	HNR Type
Differential Relationship	Good actions vs. Bad actions	Humans behave good to nature, on other side humans behave bad to nature. Upside there were natural elements like trees and animals, downward trees cut down and buildings constructed.	Steward Master Apathy
	Clean vs. Polluted Nature	Clouds are happy, on the other side bad gases are released to clouds. Birds are happy, on the other side they cannot fly, they are sad and coughing. One side is clean and beautiful, other side there are trashes on the ground. One side with trees and flowers, other side there is no trees.	Master Apathy
	Retrospection vs. Prediction	One side is ten years ago, children throw trash, other side is ten years later and the trashes are still there. There were trees and mountains, after ten years these trees are cut down and instead of mountain there are buildings. Ten years after these buildings are releasing gases. One side is where humans live and other side is nature itself. Before COVID-19, world was polluted, after COVID-19 world is cleaned. Nature renewed itself with COVID-19. Nature became clearer with COVID-19.	Master Apathy

Table 3-7 Coding Rubric for ‘Card Selection’ Task: Student’s own Ideas regarding Images of Human-Nature Relationship

Categories	Codes	Phrases
Stewardship (Stewards of Nature)	Taking care of nature	Not harm nature Not create pollution (air, soil and water pollution) Not build houses Recycle Attach filter to factory chimneys Afforestation Plant seeds/trees/sapling Raise awareness of people Not throwing trash/pick up trash Feed animals Not harm animals Not cutting trees Prevent hunting Not picking up flowers Provide nest for animals (i.e. Natural life parks) Not walk on the flowers and grass Use renewable resources (use clean energy) Nature is our home
	Technology for nature Responsible to protect nature	Use technology for welfare of nature Protect nature from bad people Protect nature because its god's creation Protect nature for future generations /other people Feel responsible to protect nature
	Impact on nature	Impact on nature My attitudes have an effect on nature both good or bad

Table 3-7 (cont'd)

Categories	Codes	Phrases
Partnership (Partner with Nature)	Having equal value	Nature and humans have equal value All livings are same Do not dominate Fifty fifty (nature is) not the servant of humans Symbiotic relationship / win-win / reciprocity of welfare / mutual dependence Dependent on each other Balance of nature Help each other as they need each other When nature harms, I am hurt. Share the same world Live in the same world
	Interdependence to each other	Technology for both welfare of humans and nature
		Technology for humans and nature
	Affection toward nature	Affection toward nature Wishing nature to be wider Being in nature makes me happy Innate bond Bond between nature (physical and spiritual) Love nature Be friends with animals Mothernature can rule itself, not humans. No technology in nature The originality of nature disturbed with technology Not will the same as before Not use technology to change nature Not interfere nature with technology
	Superiority of nature	
	Technology harmful for nature/ Distortion of the purity of nature	
Participant (Participant in Nature)		

Table 3-7 (cont'd)

Categories	Codes	Phrases
Nature Distant Guardian	Being distanced from nature	Distanced from nature Not hand in hand with nature, but love nature Not too much interaction with the natural assets Cannot live without technology / not keep away tech. Quite a while
	Protecting nature from city/home	We are suitable for city life Living in city life, not in nature With social media raise awareness We can protect nature from home
Master of Nature	Dominating over nature	Have power over animals Use technology and money just for my will
Apathy toward Nature	Not caring nature	No need nature to live
User of Nature	Using nature to meeting my needs	Provides life, without it I cannot live Provide fresh air Get fish Provide clothes Cutting down trees for furniture Provide paper Provide nutrition (egg, milk from animals; bread, wheat from plants) Picking up fruits- vegetables (without harm them) (get apple) Provide water Use raw material (petrol etc.) Use but not excess Everybody should use, so not use excess Provide good view /nice scenes
	Supported by nature	
	Using natural resources, but not excess	
	Using nature for enjoyment	

Similarly to the students own ideas regarding appropriate relationship with nature, how they view humanity's relationship with nature and what they think about the humanity's present types towards their relationship with nature was examined with the help of the similar rubric with some minor changes. In the following Table 3-8., you can see the rubric for how students view other people's relationship with nature.

According to this coding rubric, views of students towards how humanity's relationship with nature is and what other people's types are were easily detected. This coding rubric was adapted as the same way with the rubric used for detecting students' own ideas regarding human-nature relationship with minor modifications.

Since there were some relations and overlaps between the explanations and drawings of children, according to the in-depth analysis and characteristics of the HNR types, some differences between the categories were detected and explained in the Table 3-9. in order to be precise while analyzing. Differences between the categories is to ensure that rubric and data analysis were completed consistently. In order to decide on which student in which category, these differences helped researcher during the data analysis. When deciding on the categories, these differences revealed during the data analysis by the researcher with the aid of definitions taken from the literature.

To sum up, with the help of the two version of similar coding rubric, views of nature of students toward human-nature relationship were examined from two different aspects as (i) students' own views on appropriate relationship of humans have with nature and (ii) students' views on how other people have relationship with nature.

Table 3-8 Coding Rubric for 'Card Selection' Task: Other People's Images of Human-Nature Relationship

Categories	Codes	Phrases
Humans as Master	Harming nature	Hunting animals Create pollution Destroy/ruin natural places Create agricultural lands by cutting trees For own profit building houses Cause extinction/decrease in biodiversity / Cause greenhouse effect / acid rains For own profit / for own sake Factory gases that pollute air Disturb animals / harm marine animals Deforestation - cutting trees Exhaust smokes of cars Dominate for earning money / dominate nature for trade Power over animals Not want natural assets around them Think nature occupy place more Nature occupy more place Can use nature whatever they want/ Do whatever they want Act like only they live / only think themselves
Humans as Apathy	Apathic to nature.	Not realize the beauty of nature Not care nature and nature becomes bad/ not realize that nature is ruined Not care animals' life Not think that they have an impact on nature Not give value to nature

Table 3-8 (cont'd)

Categories	Codes	Phrases
Humans as Stewardship	Taking care of/ protecting nature	Feed animals
		Picking up trash
		Protect nature
		Not pollute
		Care plants
		Behave in good manner
		Impact on nature both good and bad way
Humans as User	Impact on nature	Provides life, without it I cannot live
		For heating need
	Using nature for meeting their needs.	For enjoying
		For nutrition
		For fresh air
		For calm environment
		For earning money
		For making furniture
		For making paper
		For building house
		For clothing
		For shelter
		Provides calm environment
		Build (factories, houses, skyscraper) more than needed
Using nature excessively.		

Table 3-8 (cont'd)

Categories	Codes	Phrases
Humans as Nature Distant Guardians	Being distanced from nature.	Humans are in the city Distanced from nature Using social media for raise awareness of people Organizations for welfare of nature Nature and human are separated Like they live in different worlds
	Interdependence to each other	When humans harm nature, nature harms humans (Boomerang) Share the same world Symbiotic relationship Live in same environment Equal rights of living Nature and humans have equal value All livings are same
Humans as Participant	Having equal value	
	Love of nature.	Enjoying beauty of nature Resting under tree peacefully Watching the view of nature Listen sound of nature Smells nature Feels nature Part of nature
	Being part of nature.	

Table 3-9 Differences between HNR Typologies

Difference-1. Stewardship vs. User	In Stewardship, explicit protection and action for protection should be emphasized. It is mentioned the responsibility towards other livings, future generations or because of it is God's creation.	vs.	In User, mostly usage of natural resources emphasized. It should not be mixed with the stewardship because of phrase that participant says: 'Use natural resources but not excess'. Since this phrase is also points out the usage of natural resources 'without using excessively', it should not be indicated as Stewardship, because there was no emphasis on usage of natural resource in the Stewardship.
Difference-2. Master vs. Apathy	In Master, explicit domination of nature for own profit should be emphasized. It should be mentioned explicit intention of destroying nature with technology and/or/ money or for earning money.	vs.	In Apathy, explicit lack of caring and valuing of nature should be emphasized. It mentions that no need for nature to live.
Difference-3. Partnership vs. Stewardship	In Partnership, there can be emphasis on protection of nature but there should be a win-win and for benefit of both nature and humans emphasis.	vs.	In Stewardship, no explicit emphasis on the win-win situation, rather they focus on examples for protecting nature.
Difference-4. Partnership vs. User	In Partnership, there can be emphasis on meeting needs, but while benefiting reciprocally and symbiotically.	vs.	In User, there is emphasis on just using the natural resources, there were not win-win situation for both nature and humans.

Table 3-9 (cont'd)

Difference-5.	In Stewardship, explicit protection and action for protection should be emphasized. It is mentioned the responsibility towards other livings, future generations or because of it is God's creation.	vs.	In NDG, there should be explicit emphasis on protection from home, without leaving the city life. It is expected to found distance from nature itself. Environmentally friendly life style such as using technological tools to save the nature, having a pet, recycling is enough for this typology of people.
Difference-6. Master vs. User	Both of the types can emphasize meeting needs from nature; however, in Master superiority and domination for own profit should be emphasized.	vs.	Although both typologies mention meeting needs from nature, User typology, there is an emphasis of meeting needs for survival. Besides, User typology pay regard to the safe usage of natural resources just for being alive (i.e. for water need, heating need)
Difference-7. Participant vs. Partnership	In Participant, protecting and behaving well to the nature just because they have affection towards the nature and because of the bond between each other.	vs.	In Partnership, there is an emphasis on protection for benefit of both humans and nature and the symbiotic win-win situation.
Difference-8. Participant vs. Stewardship	In Participant, protection of nature was emphasized for the affection towards nature and the both physical and spiritual bond between each other.	vs.	In Stewardship; however, protection of nature was the main point and the protection is emphasized for the responsibility towards other livings, future generations or because of it is God's creation.

According to their views, the typologies of students selected for themselves and humanity's present relationship with nature was also offered by considering the characteristics of typologies that is proposed in the literature. Lastly, it is crucial to point out that while analyzing the views of students toward HNR, qualitative data was quantified and the frequencies of indications related to the typologies were detected. In other words, typologies of students related to their ideas on relationship with nature and how they view humanity's typology of relationship with nature were identified based on the what is represented and mentioned 'more' in terms of frequency. Detailed findings related to the human-nature relationship from two aspects (the students' views on appropriate relationship with nature and the views of students regarding humanity's relationship with nature) can be found in the result section.

3.5 Trustworthiness of the Study

As stated in Merriam (2009), all researchers are concerned to conduct both reliable and valid studies by considering ethical manners. Since the collection of data and interpretations of findings highly depend on the researcher in qualitative researches, standards for being able to trust in qualitative studies differs from the quantitative researches (Fraenkel , Wallen, & Hyun, 2012; Merriam, 2009). In this regard, different terminologies are using such as credibility, dependability, confirmability, and transferability in qualitative studies for the reliability and validity measures (Mertens, 2012; Merriam, 2009; Lincoln & Guba, 1985). These terminologies are discussed as the common measures to achieve trustworthiness in qualitative studies (Lincoln & Guba, 1985). In order to see how the trustworthiness of the current study was established, each criteria (credibility, transferability, dependability, confirmability) were presented in the following parts.

3.5.1 Credibility

Credibility is one of the criteria that provides trustworthiness in the study and is parallel with the internal validity in quantitative studies (Mertens, 2012; Lincoln & Guba, 1985; Merriam, 2009). According to the Merriam (2009) credibility seeks answers related whether findings of the study matches with the reality or findings measures what is intended to be investigated or not. In order to ensure credibility, Lincoln and Guba (1985) suggested five techniques and several activities underneath of these techniques. These activities to provide credible research were (a) prolonged engagement, (b) persistent observation, (c) triangulation, (d) peer debriefing (peer examination), (e) negative case analysis, (f) referential adequacy and (g) member check. In the present study, triangulation and peer debriefing (peer examination) were used to ensure credibility.

According to Guba and Lincoln (1981), triangulation is controlling the obtained data ‘either with other members, or with other methodological tools and measures’ (p. 186). Correspondingly, Denzin (1978, p. 301) proposed four types of triangulation such as data triangulation, investigator triangulation, theory triangulation and methodological triangulation. In this study, three of these four triangulation types which are more common in usage (Merriam, 2009) were employed as data triangulation, investigator triangulation and methodological triangulation. For data triangulation, interviews were conducted with thirteen middle school students, and same data collection procedure were employed different grade levels which are fifth and eighth graders. In this way, as mentioned from Merriam (2009, p. 216) data triangulation was conducted by collecting interview data ‘from people with different perspectives’. Secondly, investigator triangulation was achieved with the help of the co-coder during the data analysis and interpretation. The researcher and second coder analyzed the data separately and compared their own results related to the categories, codes and the interpretations related to the data. In this way, as Patton (2002) suggested, triangulation with several investigators helped to control whether there is a bias created by the researcher or not. As a last type of triangulation, methodological

triangulation was employed in this study with the help of the usage of several data collection tools and techniques. To illustrate, data related to the views of students towards the humanity's relationship of nature were collected both from drawings of the participants and from their interview data.

Additionally, peer debriefing (peer examination) was used in the present study for establishing credibility. Peer debriefing enables researcher to evaluate whether the findings were convincing according to the data collected (Merriam, 2009) and to ensure whether researcher has remained hidden aspects in his/her mind and has biases or not (Lincoln & Guba, 1985). Merriam (2009) mentions that almost all of the students that write dissertation uses peer debriefing method because the dissertation committee and the advisors check and give feedbacks to the findings frequently. Therefore, since researcher studied with the graduate master's degree student while analyzing data and the advisor of the study always checked and gave feedbacks related to the findings, peer debriefing was achieved for credibility of the study.

3.5.2 Transferability

Transferability is parallel with the external validity term used in the quantitative researches (Mertens, 2012; Lincoln & Guba, 1985; Merriam, 2009). According to the Lincoln and Guba (1985), transferability is to degree whether the results of study can be transferred to other contexts or samples. In order to meet transferability – which is the usability of the study results to the other samples-, researcher should give sufficient details to the reader to make them understand whether the findings of the study can be transferred their own context or not (Mertens, 2012). In order to achieve transferability, Merriam (2009) provides two strategies, which are using rich and thick description and the maximum variation.

In this study, to establish transferability rich and thick description of the study was presented. According to the Lincoln and Guba (1985), since qualitative researchers cannot generalize the result as done in the external validity measures, researcher can

give detailed information to show the other researchers that the findings and context of the study can be transferable. Merriam (2009), similarly, defines that this strategy is related to give broad and detailed descriptions of participants, settings, findings and notes from the study. For this reason, researcher provided sufficient and detailed information about the participants, setting of the study to give insights to another researchers according to the applicability of the present research to other studies or not.

Additionally, all of the data collection and analysis procedure was shared in detail. Findings of the study were supported with the help of the quotes from interviews of students to ensure qualified evidences were given. Under favour of rich and thick description of this study, science educators and teachers can easily transfer the findings or context to their own teachings or researches.

3.5.3 Dependability

Dependability corresponds to the reliability terms used in quantitative research designs (Mertens, 2012; Merriam, 2009). According to the Lincoln and Guba (1985), dependability defines as the stability and consistency of the results. However, as Merriam (2009) mentioned, since the behaviors of people are not stabile, it becomes problematic to ensure reliability in qualitative researches. For this reason, the interpretations of study should be supported by the data came from the participants' answers (Lincoln & Guba, 1985). Additionally, Lincoln and Guba (1985, p. 316) stated that 'since there can be no credibility without dependability, the demonstration of former is sufficient to establish the latter.' Based on this, strategies used to establish credibility such as triangulation and peer debriefing can also show that the study is dependable too.

In order to provide the dependability of the qualitative studies, strategies such as triangulation, peer debriefing, investigator's position and audit trail were suggested (Merriam, 2009). In the present study, all of these strategies were used to attain consistent and reliable study.

As discussed previously, two of the strategies used in credibility, which are triangulation and peer debriefing were used in order to achieve dependability. Additionally, investigator's position (researcher's positions or reflexivity) was used to make the study dependable. In order to achieve it, researcher's position towards the study was explained with emphasis on her possible biases and assumptions related to study. Researcher wrote a separate section in the study for reflecting herself 'critically as a researcher and the human instrument' (Lincoln & Guba, 2005, p. 210).

As another strategy to establish dependability, audit trail is used which involves describing the steps of research transparently to the readers (Korstjens & Moser, 2018). According to Merriam (2009), audit trail involves information such as how the researcher collected the data, found codes and categories and interpreted the data for meaningful information. For having an audit trail, researcher should transparently reflect the steps of the study and memos from the process of data collection and analysis by keeping research journals. For this study, researcher kept two research journals that involves memos related to each participant and the process of data collection, data analysis and ethical approvals by indicating dates. Additionally, how data was collected and analyzed and how the rubrics were adapted from the literature were explained elaborately.

Apart from these, since Creswell (2007, p. 210) indicated that reliability of the qualitative researches 'refers to the stability of responses to multiple coders of data sets' and supports the intercoder agreement as an indication of consistency of findings, intercoder agreement (interrater reliability) was also used in this study. In the current study, with the co-coders, the data set was analyzed and the stability of the data results were discussed. The disagreements were recognized and reanalyzed until the agreements were done between the researcher and the co-coder. Intercoder agreement was calculated as 92% with the formula suggested by Miles and Huberman (1994) as mentioned in the method section.

3.5.4 Confirmability

Confirmability is related to the objectivity in quantitative studies (Mertens, 2012). It concerns with whether the findings are researcher's imagination and affected from biases of researcher or it is derived from data and provide evidences to the readers or not (Lincoln & Guba, 1985), since researcher can be affected by his/her own conscious and unconscious biases and assumptions (Guba & Lincoln, 1981). According to the Miles and Huberman (1994), neutrality aspect of the study can be achieved with the freedom from the biases of investigator. Methods that used in establishing credibility and dependability should be also considered to achieve confirmability. These methods can be triangulation, audit trail and investigator's position (Lincoln & Guba, 1985). In this study, as discussed beforehand, three different triangulation method (data, methodological and investigator) was used to support the idea that the study was objective and free from the researcher's own imaginations and prejudices. Secondly, audit trail was used by keeping reflexive journals (Lincoln & Guba, 1985) like discussed in dependability. Lastly, to make an unbiased study, investigator's position was discussed in the following section, like stated in the dependability criterion.

3.6 Researcher's Position and Bias

In qualitative researches, humans are at the focus point and for this reason perceived as both suppliers of data as participants and the data collectors as researchers. When considering researchers, they were accounted as the instruments of qualitative researches for both the collection and analysis of data procedures (Merriam, 2009; Guba & Lincoln, 1981). However, being perceived as primary instrument is a double-edged situation such that even though it has advantages, there can be drawbacks for being regarded as human-instruments (Merriam, 2009). To reduce possible disadvantages, researchers are responsible to realize, evaluate and report their own researcher biases and assumptions that might affect the direction of study

(Merriam, 2009). On this basis, researcher should also protect the dependability of the study by identifying and reducing the biases and assumptions. Although it is not seem possible to eliminate all the biases and assumptions of researchers completely, they are expected to identify, reduce and take under control these factors (Merriam, 2009).

According to the literature related to the typologies of human-nature relationship, researcher has an assumption that the students may select one of the seven typologies. However, since the present study was qualitative, some of the students selected more than one typology, especially, when perceiving humanity's relationship with nature. Since researcher identified this situation, while analyzing and interpreting data, she took her biases under control and report the findings by considering the answers of the participants. Additionally, in order not to create biased analysis and to prevent researcher from affecting by the findings in the literature, interviews and drawings were interpreted with the help of the second coder. They analyzed data individually and compared the results. In this way, possible researcher bias that might impact the study was reduced.

Additionally, since researcher has a role as interviewer, in order to prevent overinterpreted results and possible effects of researcher bias and assumptions while collecting and interpreting the data, students were requested to share their opinions honestly. They were informed that there is no one and true answers to the questions directed to them. They were comforted to express themselves honestly. In this way, as the researcher collected the data rich and in-depth, the danger of reflecting researcher bias, assumptions and overinterpretation were reduced.

3.7 Researcher's Motivation

When researcher of this study was a child, she grew up in a place where she was heavily involved with the nature. It was remembered by the researcher that, going back in time, as technology did not use to be a factor for staying at home in her childhood; she used to play outside, form friendships with the animals, observe and

love them. Nevertheless, as researcher observed, so far from her experiences as trainee teacher and children of her family, she have realized that today's children do not develop the habit of touching with the nature surrounding themselves.

After a brief research, researcher has supported her own observations with the scientific and empirical studies. Different researchers from multidisciplinary stressed that childhood experiences in nature and children's relationship with nature have an enormous impact on their physical, cognitive and emotional developments (Kahn & Kellert, 2002). When considering the developments of children are affected by their relationship with natural environment, researcher thought that students' views toward nature and the relationship with it should be investigated in the educational context. For this reason, during the investigation of literature for this study, researcher read the book of Richard Louv that named as "The Last Child in the Woods". Some points focused on the book motivated researcher to study on the children and their relationship with nature more and more. With the fundamental alterations occurred in today's world such as increase in human population, demanding resource and land consumption and in turn, reduction in healthy natural environments, children's relationship with nature in modern societies, especially in urban sites, was diminished (Kahn & Kellert, 2002). Additionally, to these impacts, the approach of parents induced to increase the gap between the children and nature. To put a finer point on it, it was indicated in the book that with the developing countries, technological advancements, increase in urbanization and deforestation stimulated parents to protect their children and make them stay at home (Louv, 2018). As a result, an obtrusive and a little bit worrying phrase was indicated by Louv (2018) to explain the situation of relationship of children with nature: 'Nature Deficit Disorder'.

This phrase directed researcher to think on how today's children view nature and their relationship with it. Furthermore, researcher found herself thinking on how the children view the relationship of their parents and other people with nature. In this way, along with the views of students on nature, human-nature relationship was investigated from two different perspectives by the researcher. Apart from the views

of nature and human-nature relationship, researcher encountered with the values of nature and realized that these three components can be examined under the umbrella-term 'Visions of Nature'.

As a result, researcher designed the study for examining views on nature and human-nature relationship of middle school students towards nature and students' valuations towards nature were examined.

3.8 Ethical Considerations of the Study

Before conducting the study, firstly, the researcher applied to the Ethics Committee of METU to receive an approval for the data collection tools. After the approval of Ethics Committee of METU, required documents for application to the Ethics Committee of MoNE were prepared and sent. The ethical approvals received from both METU and MoNE can be found in the Appendix C and Appendix D, respectively.

According to the ethical principles that were listed by the the Committee on Scientific and Professional Ethics of the American Psychological Association, Fraenkel , Wallen, and Hyun (2012) proposed three main ethical issues which are harm, confidentiality and deception.

First of all, researcher should ensure that the participants of the research do not exposed to any kind of harm (Fraenkel , Wallen, & Hyun, 2012). Researchers were expected to inform the participants related to any kind of danger or potential harms caused by the research (Fraenkel , Wallen, & Hyun, 2012). This study was designed in a way that no one would be harmed. Informed consents of both participants and the parents were obtained. In this way, participants were informed related to the content of the study and protected from any potential harm. Additionally, to ensure, researcher was questioned herself from the 'ethical issues checklist' provided by Patton (2002) and considered the points stated in 'risk assessment' part. Lastly, the right of withdraw from the study were explained to the participants and their parents.

They were informed that they can leave the study whenever they feel discomfort or at risk. In addition to the participants' physical and psychological welfare, as stated by Patton (2002), interviewer's mental health was taken into consideration for the researcher in order not to affect from the interviews.

Secondly, researcher should ensure the confidentiality of data (Fraenkel , Wallen, & Hyun, 2012). In order to achieve it, at first, both participant students and their parents were informed and promised that their personal information and collected data would be kept confidential. To make it possible, names of the participants were deleted and pseudonyms were given each of them, instead of using their real names. The participants and their parents were informed that their data would be stored in encrypted files in the computer which is in the access of only the researcher.

Third of all the ethical considerations, deception did not take place in the present study. The content and purpose of the study were expressed clearly and transparently to the participants and their parents. Additionally, there was not any cover stories to deceive or manipulate the subjects.

3.9 Limitations of the Study

In the present study, some restrictions were identified with regards to the nature of the study. Corresponding with the nature of study, since the present study was designed as single-case study, it brought some limitations such as replicability. According to Yin (2018), single case studies are more vulnerable and have less possibility of replications. It is proposed that analytical findings and benefits received from the findings of study were less powerful in the single case studies than multiple or two-case studies (Yin, 2018). For this reason, applicability of the present study is restricted compared to the multiple case studies. To prevent this from being a problematic limitation and to increase applicability of the study, rich and thick description of study was presented in detail in the method section.

The other aspect for limitations in the study was data collection tools. One of them is related to the researcher. Since researcher can be regarded as the human-instrument and can be regarded one of the data collection tool in the study, the unconscious biases might be limited the study. To reduce this limitation as much as possible, researcher's position and biases were noted down and researcher gave feedback to herself after every interview. The analytical memos were kept by the researcher.

Additionally, although drawing is highly used data collection tool for understanding views and inner worlds of students on a specific subject, it sometimes creates limitations for the studies (Novick & Nussbaum, 1978). Students, who do not want to draw or do not have skills on drawing, abstained from being judged that their drawings were not good and understandable. In order to prevent this situation, researcher encouraged the students who think that their drawings are not good and indicated that their opinions while drawing is important for the her, not just the drawings. Besides, since drawing skills of some of the students were limited, their pictures were needed to be elaborated by the students' explanations to make drawing clearer. To achieve this, interviews were used to obtain opinions of students in-depth.

3.10 Summary of Method

In the following figure, there was presented summary of research method from the beginning to the end of the research. As can be seen from the Figure 3-8., literature review was done during the study constantly. Data collection tools were prepared by considering the related literature in the field of environmental psychology and philosophy. In this process, expert opinions and data came from the pilot study were considered. According to the comments, the revisions of the data collection tools were completed. Researcher applied to the necessary Ethical Boards for getting approval for the data collection tools. After the data collection tools and ethical considerations were approved from related institutions, the participants were selected according to the boundaries. After the data collection tools and process were prepared by the researcher, participants were selected. Semi-structured interviews

were employed with three supportive data collection tools and techniques such as guided-imagery technique, drawing with draw-and-explain technique and card selection task. Data analysis were aided by a CAQDAS, specifically the 'MAXQDA 2020'. Qualitative content analysis were used and three adapted coding rubric for each unit of analyses supported the analysis process. Trustworthiness of the study were checked and ensured that the study is worth for consideration.



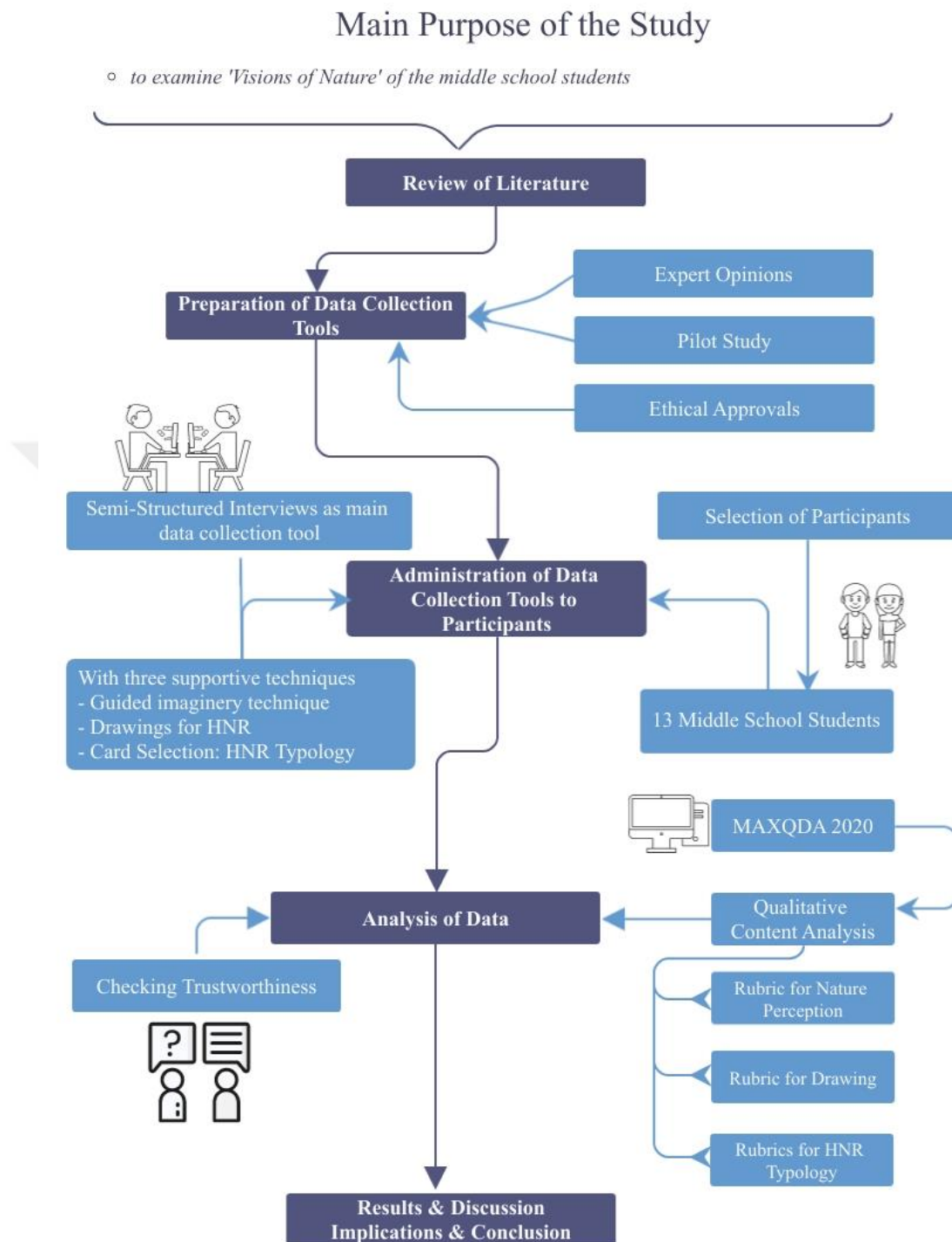


Figure 3-8 Summary of Method



CHAPTER 4

FINDINGS

The purpose of this study is to investigate visions of nature of middle school students which includes their views and images toward nature and human-nature relationship. In this chapter, results of the study was presented under three main components of visions of nature framework: (i) image of nature, (ii) values of nature and (iii) images of human-nature relationship which concentrates on both how students view their own and other people's human-nature relationship. Firstly, images of nature of students were presented under four categories such as natural setting, species in natural settings, activities done and materials used in nature and feelings towards nature. Secondly, the findings related to values of nature were presented to show whether the students view nature as important or not and the reasons behind their views. Thirdly, the findings related to the images of human-nature relationship component were presented. Under this part, both the students' own idea concerning the ideal relationship between humans and nature were discussed and the students' views on relationship of other people have with nature were examined.

4.1 Middle School Students' Images of Nature

Images of nature examines whether students view nature as real nature or not (van den Born, 2008, p. 92). This component of the visions of nature enable to examine how students view and describe nature. The following research question guided the present study in the context of images of nature.

Research Question 1.1. How do middle school students view nature?

In this study, guided-imagery technique was used to investigate how the students view nature, more specifically how they visualize it and what comes to their mind when said spending time in nature.

Findings on the middle school students' images of nature were presented under four aspects namely natural setting, species in natural setting, activities and materials in nature and feelings in nature.

4.1.1 Natural Setting

While analyzing the students' images of nature in terms of natural setting (inside or outside; real or mythical; closeness to city center), it was found out that all of the students imagined themselves outside and in a real-life context. None of the students visualized inner or mythical places. To be more specific, “forests” and “greenery” were the most frequently used words while describing the natural context they imagined. As reflected in the wordcloud in the Figure 4-1, the most frequently used words (i.e. forests, greenery) can be seen larger than least frequently used words (i.e. village, beach). Most of the students visualized themselves in forestland or in greenery along with water resources such as riverside and lakeside.



Figure 4-1 Word Cloud for Natural Setting

Furthermore, the response of the students were analyzed in the natural context with regard to closeness to city center. Few of them (four students) imagined themselves

in a familiar place such as their home garden, public tea gardens, nearby woods or picnic area in the city. Most of the students (nine students) imagined themselves in distant places, which is generally out of city life and away from where they live. In other words, the students generally associated the nature with the distanced places, which is out of city, wilderness and away from the crowd of faces and technological devices.

Apart from the word clouds, Table 4-1. provided an overview for the categories, codes and phrases found for analyzing natural setting theme of the students' images of nature.

Table 4-1 Overview of Results for “Natural Setting” Category

Category	Sub-category	Code	Phrases & Frequencies
Natural Setting	Inside or Outside	Inside	None
		Outside	13 (All of the students)
	Real or Mythical	Real*	13 (All of the students): forests (12), greenery (8), river (3), lakeside (2) , beach (2), sea (2), mountains (2), garden (1), puddles (1)
	Closeness to city center	Close to city center*	4 students: nearby picnic area (2), nearby woods (1), home garden (1), public tea garden (1)
		Away from city center*	9 students: out of city (6), Amazon forests (1) , deserted forest (1), wild nature (1), place with less-human (2), village (1), virgin area (1), places without human-made things/ technology (3)

(*) shows that students can use more than one words to explain natural context.

In parallel with the common findings, the students depicted their imaginery while they are in forests or in a greenery. Some of them added some other natural contexts such as riverside, lakeside with a greenery land. To illustrate, when the researcher asked to explain their imaginery, the students imagined themselves as in the following:

Researcher: *Where are you now, in your dream?*

Tunahan: *I was in the forest, there were a lot of trees and there were squirrels in the trees. I was walking in a greenery place. There was a bridge and under that bridge, river was curling. (5th grade, Male)*

Deniz: *I was in a place like a vast plain, but in the forest. I and my friends were walking in the forest. (5th grade, Male)*

Beren: *(...) I was in a beautiful ecosystem. That place was beautiful. I was in a place where is green, but in the mountains. There were forests on the mountain. (5th grade, Female)*

Emre: *I was in the forest, there were green climbing plant everywhere. (...) There were puddles. Where I am is like the Amazon forests. (8th grade, Male)*

Most of the students also view nature as place, which is distanced from city life, away from the built environment and human-made structures, a place without technological tools and internet. They also thinks that nature is where people lived very loose, because people generally prefer to live in cities and towns. Most of the students imagined themselves away from the city centers when they are requested to visualize themselves in ‘nature’.

Mehmet: *A place without man-made things, without huge buildings. Only natural things and sound of nature, I imagine. (8th grade, Male)*

Gamze: *Being in a green area, in a forest. At the same time, being in nature means being in beach. I think that places like villages and I guess, where people are very rare is nature for me. (8th grade, Female)*

Beren: *Being in nature is away from the noise pollution of city. It is so comfortable, there is no sound. Only birds are singing. Very peaceful. (5th grade, Female).*

Most of them preferred green and forest areas; while few of them mentioned water ecosystems such as lakesides and beaches. In other words, all of the participants

imagined natural setting as outside and real when asked to describe their natural setting in the imaginery.

In addition, some of the students depicted that the nature is a place where the humans are rare, human-made things and buildings are not exist and as a place without technological devices and internet connection.

Fatih: *Here, where I imagined myself, there are no technological devices, there is nothing can bother me. (...) Here is a place that reminds me forests with yellowed leaves (5th grade, Male).*

Miray: *Being in nature is like camping. Without electronic tools, away from the city life. Without internet. (8th grade, Female).*

Apart from viewing nature as a distant place, the students depicted nature as a place without technological devices and internet access.

On the other hand, there are some students who depicted nature as a familiar places nearby the city center such as tea garden, picnic areas near the city and their own gardens. To illustrate, some of the students' dialogue can be seen in the following:

Ecem: *In my imaginary, I was in the grandmother's home garden. She has a huge garden. We are playing with my cousins and picking up the fruits (...). (5th grade, Female)*

Funda: *I imagined a picnic area. Me and my friends from my previous school had a picnic there before. There were trees and benches. We were went there with school, it was close. (5th grade, Female).*

Ezgi: *I imagined myself in a place that people can go and meet with their families, like a public picnic area. People were chatting, eating and sitting on the grass with their camping stools. (8th grade, Female)*

Deniz: *I was in a forest with camping area with my friends. (...) However, it was not away from the city life.*

Researcher: *Why do you think that the place you imagined is not distant from the city life?*

Deniz: *Because it reminded me Kızılcahamam camping area [a district in Ankara city]. (...) There, the trees were cut down and the place was fenced out by the owners. That is why I felt like I am close to the city center. (5th grade, Male)*

4.1.2 Species in Natural Setting

Under this subheading, species in the natural setting were presented in order to understand how students view nature and its elements. Livings that is imagined by the students were analyzed under two subcodes as “kind of species (wild, familiar and mythical)” and “roles of species in the imaginery (positive, negative, unspecified)”. When considering these, analysis presented that essential elements in the imagineries of students were “*animals*” and “*plants*”. Most of the references were made on the “*trees*” for exempflying plants and “*birds*” for exempflying animal species. Few students emphasized wild nature species in their imaginary by illustrating with the words such as “*gazelles*”, “*lions*”, “*bears*”. It should be noted that few of the participant included “*other humans*” in their imaginary. Apart from imagined themselves in the nature, six students indicated existence of other people too.

Another wordcloud was constructed to show the frequencies of the used words related to species in the natural setting. As can be seen in the Figure 4-2, animals, trees, plants and birds were the most frequently used terms while they are explaining their images of nature. In order to make the distribution of words with its frequencies and codes, the Table 4-2. can be examined below.



Figure 4-2 Word Cloud of Species in Imaginary

Table 4-2 Overview of Results for “Natural Species” Category

Theme	Category	Code	Phrases & Frequencies
Natural species	Kind of species	Wild /Unfamiliar	gazelles (2), lions (1), bears (1), deers (1), spiders (1), woodpecker (1)
		Familiar	other humans (6), animals (12), birds (8), squirrels (3), cats (3), dogs (2), geese (1) rabbits (1), moles (1), weasels (1), bugs (1), lambs (1), ducks (1), plants (11), trees (10), flowers (3), pine-tree (1), pine-cones (1)
	Roles of species	Positive*	4 students: friends with animals (1), keeping company to him/her (2), playing with animals (2).
		Unspecified	9 students

(*) shows that students can use more than one words to explain the roles of natural species.

As can be seen from the findings, the most frequently used word was “*animals*” for the species. In the following, there were given students’ statements that mentioning familiar animals in their visualization:

Researcher: *What did you visualized when say “being in nature”?*

Tunahan: *A very green place, trees and animals. That’s all.*

Researcher: *What kind of animals came to your mind?*

Tunahan: *More like ducks, lamb, goose...(5th grade, Male)*

In addition to the familiar animals, few of the students mentioned wild animals in their views of nature:

Fatih: *When say being in nature, there imagined in my mind wild nature. (...) There were bears! (5th grade, Male)*

Beren: *It comes to my mind, forests, plants, animals. (...) Deers, gazelles... For example, the lions! (5th grade, Female)*

Moreover, the students view nature as a place with lots of plant species such as trees and different kinds of flowers:

Researcher: *What did you visualize when say “being in nature”?*

Mehmet: *There were a lot of of long trees, a lot of colorful flowers. River was curling between the trees. (8th grade, Male)*

Arda: *There were a lot of long trees. Other than trees and road, there was nothing else. (8th grade, Male)*

Miray: *I am imagining lots of trees. There were a lot of trees and I can smell their odor. (8th grade, Female)*

Similarly, some other students viewed that when considering nature, green colour and trees comes to the minds of people by stating:

Researcher: *What did you visualize when say “being in nature”?*

Elif: *There were a pathway. Then, there were grass, trees, a lot of plants. This pathway ending with a river. (5th grade, Female)*

Tunahan: *There was forests full of big, long trees. There were squirrels on the trees. I was walking on this greenery places between the trees. (5th grade, Male)*

One of the fifth grade student indicates that trees are the first thing to consider when saying nature. He states the reason by saying:

Deniz: *...when saying nature, firstly ‘trees’ come to my mind, because the basis of nature is trees.*

Researcher: *Why do trees are the basis of nature?*

Deniz: *Because if there are no trees in nature, there is no oxygen in the world, and there will always be erosions and floods without trees. Thus, I think trees mean nature. So, I think trees are the foundation of nature. (5th grade, Male)*

Different from these examples, six of the students were depicted humans in their visualization. While some of the students depicted family members; some of them visualized their friends in their image of nature:

Deniz: *There is trees where I imagined. I and my friends going for a walk in the forest, and we are doing camp in here, now. (...) We are going for picking up fruits (5th grade, Male).*

Ezgi: *(...) There were too much people. Youngs, elderlies... There were dogs walking with the humans. And birds. [There is]Nothing else than these... (8th grade, Female)*

Fatih: *There were trees and benches. I and my friends are playing football, our moms are preparing lunch for us. (...) My brother is watching us (5th grade, Male).*

Miray: *(...) There are a lot of people in my imaginery now who that I do not know and my family members. We are so crowd. We are jumping rope (8th grade, Female).*

Ecem: *I and my relatives are in my grandmother's village. (...) There is river and my grandmother, my cousins and I going to catch fish. We are having such a fun (5th grade, Female).*

Funda: *With my old classmates, we are going to picnic. We are so much having fun. We are playing dodgeball, are having barbecue. After that rain is starting, but after rain stop, we continue to play dodgeball with my friends (5th grade, Female).*

Moreover, although most of the students do not mentioned the roles of species in their imaginery, none of the students matched the roles of natural species as negative. In fact, some of the students assigned roles to the natural species in their imaginery with positive statements like being friends with animals, loving animals, playing with animals. In the following, positive roles that are assigned to natural species can be seen:

Deniz: *(...) In my imaginery, there were moles and weasels, we [I and my friends] were playing with them and loving them. Then, we were trying to hold the birds on the trees on our fingers. (5th grade, Male)*

Mehmet: *A bird settled on my shoulder. (8th grade, Male)*

Researcher: *What did you do then?*

Mehmet: *I was sitting with the bird. It was keeping me company. (8th grade, Male)*

Elif: *I felt like natural livings was beside me, keeping me company, I did not feel alone. (...) We were looking to each other. (5th grade, Female)*

From the students' statements, it can be understood that participants view nature with the company of species such as animals (both familiar and wild) and plants like trees and flowers.

4.1.3 Activities and Materials

When analyzing the views of students toward nature, both the activities they performed and materials they used during the activities were analyzed. As students were wanted to imagine themselves doing something in the nature, their activities in the imagery was analyzed. In order to be more precise while analyzing, activities of students were examined under two categories as consumptive and non-consumptive activities. With the analysis, it is examined whether students are taking part in the consumptive (i.e. grilling, picnic, and hunting) or non-consumptive activities (i.e. observing nature, walking in the forest). Besides, it was aimed to understand whether students use human-made materials (i.e. park benches, slides, buildings) or natural materials (i.e. soil, rock, plants) in their images of nature.

According to the analysis, majority of the students imagined themselves doing non-consumptive activities; while some of them mentioned themselves doing activities both consumptive and non-consumptive. The participants mentioned non-consumptive activities most frequently imagined themselves while *“playing and spending time with animals”* and *“observing nature”*. Activity such as *“trekking in the forest”* followed the former two activities. On the other hand, even a little, some of the participants indicated themselves doing consumptive activities and most frequently, they were imagined themselves while *“doing or going to picnic in the forest or in the park”*. Table 4-3. can be seen in order to examine the activities' distribution under two main category (consumptive and non-consumptive activities).

Table 4-3 Overview of Results about Types of Activities

Type of Activities	Example of Activities	Frequencies of Activities
Non- Consumptive Activities	Playing, loving and spending time with animals	7
	Observing nature	5
	Trekking/Walking in the forest	5
	Playing football/ volleyball with friends	2
	Playing ' <i>Survivor*</i> '	2
	Camping	2
	Resting under tree	1
	Running in the road between trees	1
	Jumping rope with family	1
	Climbing trees	1
	Chatting in the park and eating	1
Consumptive Activities	Picnic in the forest	4
	Picking up fruit	3
	Catching fish	2
	Grilling	1
	Hunting rabbit	1
	Lighting a fire	1

(*) indicating a TV show that is broadcasting.

When considering the findings, spending time, playing and loving animals, observing nature without too much interaction and trekking in the forest were the most frequently imagined activities in nature. The students were generally observed nature, walking in the natural setting and spending time with animals in their imaginary.

Researcher: *What were you doing in your imaginery nature trip?*

Tunahan: *I was just walking around the forest. I was observing. I did not do anything else. Just looking around. (5th grade, Male)*

Elif: *There was a pathway and bridge. I was tracking the pathway and walking across the bridge. I was looking where the river was coming from. I observing the fish in the flowing stream. (5th grade, Female)*

One of the eight grader, female students also mentioned same non-consumptive activities as in the following:

Gamze: *I was in a tent, there were greenery around me. The sky is blue, there was a sunset. The sun and the moon sharing the same sky at that time. (...) I am setting my foot on the sand, I was walking on the beach, observing sky, the stars... There were stars that cannot seen in the city life. I am keep walking with the guidance of the light of moon. (8th grade, Female)*

On the contrary, there were a considerable amount of students who were imagine themselves doing a consumptive activity. Most of these students depicted the same visualization, which is “*doing picnic in the forest/park*”, “*catching fish*”, “*picking up fruit*”, “*grilling*”. To illustrate, there were presented examples from the students’ statements.

Researcher: *What did you visualize?*

Funda: *I am with my classmates and teacher, making a picnic. We were eating there. There were park benches with the roof, like in the picnic places. We were making barbecue. It was fun. (5th grade, Female)*

Fatih: *There were park benches. I and my friends playing footbal, my mom is preparing the meal. (5th grade, Male)*

Ecem: *We are in my grandma’s village. There, we were having picnic with all my family. I and my cousins picking up fruit in grandma’s garden. Then, we are going to the river nearby, we are trying to catch fish with my grandmother. (5th grade, Female)*

Emre: *I was in a place like Amazon forest. (...) I was hunting rabbits there.*

Researcher: *Why did you hunt rabbit?*

Emre: *Probably, I will eat it. I was lighting the fire (...) to keep me warm. (8th grade, Male)*

Miray: *I am jumping rope with my family, we were doing picnic and grilling there on the barbecue. (...). I and my family walking around the forest to pick up some branches for lighting the fire. (8th grade, Female)*

As can be seen from the students' sharings, most of them mentioned non-consumptive activities; however, some of them imagined themselves while making picnic and grilling, which are regarded as the consumptive activities.

Other from the activities, the materials they imagined in the nature were also analyzed and it is found that most of the students did not mentioned any materials in their imaginery; however, some of them mentioned "park benches, roads and bridges" as human-made materials in the nature.

While Fatih and Funda mentioned human-made materials such as park benches in their nature images; Arda, Elif and Tunahan depicted some bridges and roads that placed on the river or near the forests.

Fatih: *There were tables and it seats like benches in the park. (5th grade, Male)*

Funda: *There were arbours, when rain is started; we squeezed under its roof. Then, we ate our lunch. (5th grade, Female)*

Arda: *I was on a road between the high forest, I am running. There were just trees and road. (8th grade, Male)*

Elif: *There is a footpath, between trees, a lot of plants. The pathway comes down from a mountaind and continue into into a river. This river flows and a bridge passes over the river. (5th grade, Female)*

Tunahan: *There was a bridge, under the bridge a river flows. (5th grade, Male)*

Additionally, only one student, who is fifth grade student, Fatih used the natural materials apart from the human-made materials to play with:

Fatih: *(...) I was using the trees and branches to play "Survivor". (...) I created the Survivor race-track [like in the TV show]. (5th grade, Male)*

To sum up, activities imagined by the students were generally non-consumptive; however, there were also some consumptive activities shared by the students. When considering the materials, only one fifth grade student used natural materials to play in the nature; other participants did not mentioned any materials or mentioned some human-made materials such as bridges, park benches, tiny houses and roads.

4.1.4 Feelings in Nature

Students were asked what kind of emotions they have towards nature when they imagine themselves in nature doing something. All thirteen students indicated very positive emotions such as peaceful, comfortable, happy, joyfull, calm, freedom. The wordcloud is provided below in Figure 4-3, shows the most frequently used words in larger font size, less frequently words in smaller font size. As can be seen, all phrases indicated by students are positive.

Only three of the students were mentioned that they are scared by the spiders, birds and flies while in nature, and it is coded as a negative statement. Detailed information can be seen in Table 4-4.



Figure 4-3 Word Cloud for Feelings to be in Nature

Table 4-4 Overview of Results of Feeling to be in Nature

Theme	Category	Code	Phrases and Frequencies	
Feelings	Kind of feelings	Positive Feelings	13 (All of the students)	peaceful (8), relaxing (6), happy (6), calm (3), freedom (1), renewing (1), adventure (1), funny (1), exciting (1), safe (1), silence (1)
		Negative Feelings	3	be scared (3)

When students were asked how they feel and whether there were anything that discomfort and concerned them, they used positive statements and almost all of them indicated that there is no such thing that discomfort or concerned them. Only few of them mentioned that bugs and some animals can be scary for them sometimes.

Additionally, most of the students preferred to imagine themselves alone in the nature. They explained their reason by stating that people can feel the nature appropriately only when they are alone. Except this, as can be seen from the analysis, all of the students had positive feelings when they imagine themselves in the nature. Most frequently used words was “*peaceful*” and “*relaxing*”. From these results, it can be stated that the notion of nature were perceived as something that evokes positive emotions for the participants of the present study.

One of the fifth grade student indicated that the nature makes her feel safe. She thinks that being in nature ease to stay healthy.

Funda: *Nature sounds enjoyable. (...) I felt safe in nature.*

Research: *Why did you feel safe in nature?*

Funda: *I do not know. It felt safe being between the trees. Besides, in my opinion, there were less illness, less cigarette smoke in nature. It is more easy to stay healthy in nature. (5th grade, Female)*

Some of the students stated positive feelings and indicated that when in nature they felt peaceful and calm environment.

Researcher: Were you alone in your imaginery? Or were there any other people with you?

Gamze: *I think that nature is a place to go to relax. People can relax, can interrogate and find themselves only when they are alone. Therefore, I imagined myself alone in the nature, it makes me relax.*

Researcher: Were there anything that uncomfort and concerned you?

Gamze: *No, I focus to be peaceful, nature provides peace. Thus, there was no such thing [event or anything that uncomfort her]. (8th grade, Female)*

Beren: *I feel peaceful when I hear the voices of birds. There is no noise pollution as well. I feel happy. Peaceful... (5th grade, Female)*

Other than feeling good, peaceful and calm, some of the students scared from the natural beings in nature:

Ecem: *I felt so happy in my imaginery, but I felt uncomfortable because of bugs. (...) I am scared, although I love nature, I am scaring from bugs and butterflies. (5th grade, Female)*

Miray: *I felt uncomfortable because of bugs and flies. These made me uncomfortable. (8th grade, Female)*

Funda: *I felt uncomfortable a little bit because of the birds. I am afraid of birds. I am searching for a place like veranda when I see a bird (5th grade, Female).*

When considering students' statements and analysis, although there are few students who scared from animals such as bugs, birds and butterflies, all of the students indicated positive feelings by emphasizing the peacefullness, relaxing and calming effect of nature. To sum up, nature is viewed by the students as a place that evokes positive feelings.

4.2 Middle School Students' Values of Nature

In this part, values of students toward nature were examined. While analyzing, first it was examined whether students view nature as important or not. Then, the reasons why nature is important (or not) were analyzed from the interview data of the students. The following research question guided the present study in the context of values of nature.

Research Question 1.2 How do middle school students value nature?

The results showed that all of the students viewed nature as important and indispensable. Thus, this section presented the findings which deal with why nature is viewed as important. The reasons nature is seen as important were examined under three main categories as instrumental values, intrinsic values and neither instrumental nor intrinsic value. In the first part, instrumental values, participants had, were shown under four subheadings as nature for survival, for recreation/enjoyment, for future generations, for health. In the second part, intrinsic values toward nature were examined by considering only one subheading named as 'nature as a place for animals and plant'. Lastly, value of nature which is categorized as neither instrumental nor intrinsic was presented as values called as 'beauty of nature' and 'God's creation'.

4.2.1 Instrumental Values towards Nature

It was found that without any exception, all of the students indicated the importance of nature and emphasized the indispensability of the nature. Instrumental values were regarded in which that humans see nature as for their benefit and functionality. Under the instrumental values, four different subcategories emerged. The students explicitly stated nature is important for survival, for providing recreation and enjoyment, for health of humans and for the future generations. Since all of these reasons have more anthropocentric point of view, these reasons were gathered under the instrumental values category.

4.2.1.1 Nature for Survival

Most of the students included in the category of 'nature for survival' indicated that the nature is indispensable and necessary to survive and being alive. Generally, these participants expressed that they can survive with the help of the natural resources. They mostly exemplified that the nature provides humans oxygen to breathe, and

food and water to meet needs of censation. In other words, students under this category of instrumental values supported that nature is important to be alive and to meet basic needs such as breathing, eating and drinking water.

Views on reasons of the students provided for the importance of nature as the supplier of basic needs and as the life source can be seen as in the followings. As one of the example, Ecem, who is a female, fifth grade student expressed that nature means life to her and added like:

Ecem: *Nature means 'life' to me. It is very important for us. Without nature we cannot live because trees give us oxygen to breathe. We can take eggs from chickens and we can get protein by this way. We are benefiting from the animals, too (5th grade, Female).*

Ecem views that nature is important for her and other humans because she thinks that nature supply foods and oxygen that animals and trees produce. Similarly, she added that since nature help us to stay alive and survive, people should protect it. With her examples given, it can be seen that she has an instrumental value because she focuses on how humankind meet their basic needs from nature and keep alive.

Ecem: *We should be nice to nature, it is important for us because wihout it we cannot stay alive. (...) We should take care of nature because if we don't, we cannot grow wheat and have bread, we cannot meet our need of water. If we do not drink water and we can die. (...) If we destroy nature, we cannot survive. (5th grade, Female)*

Similar to what Ecem has indicated, Beren, a female fifth grade student who spend mostly her spare-time at outdoor, indicated the process of trees for producing oxygen and related it with the needs of humans to be alive. Beren also emphasized why humans should protect nature. According to her ideal image of relationship, as the nature is life source and living things cannot live without the existence of nature, she emphasized that she and other humans should protect the nature. In other words, Beren conveys her views that nature is important and should be protected because it is the life source for living things like in the following:

Beren: *(...) If nature is destroyed, all livings will disappear. Nature provides all basic sources for living things, including humans, to keep us alive." (...) Nature is important. (...) because plants, for example, trees photosynthesize*

and provide us oxygen by using carbondioxide. They clear the air. That's how we can breathe. (5th grade, Female)

She added other examples related how nature helps us to be alive and how people have their basic needs while disagreeing with the thought balloon of 'Apathy' type.

Beren: *Nature has so much impact on our lives. Actually, nature is important for us because it is the source of our lives. All in all, it [nature] provides us water, air and basic needs such as oxygen. (...) Nature is important for us because we are living thanks to animals. After all they provide us food. If we consider our basic needs it is very obvious: water, oxygen, food... All thanks to nature. (5th grade, Female)*

Beren thanks the nature because it provides basic need of humans such as oxygen, water and food. As a result, she views that the nature is important for her to survive and meet needs. Besides, she mentioned the importance of protection of nature.

Fatih, similar to Ecem and Beren, pointed out how nature keep us alive and supply basic needs by giving specific examples as in the following:

Fatih: *Nature is important because trees photosynthesize. They provide us to get oxygen. Animals help us to get milk. From the plants... For example we can get carrots. We can eat them and make dinners. (...) Nature keep us alive (5th grade, Male).*

As can be understood from his views, Fatih views nature as important because it provides oxygen to breathe and foods to eat.

Funda, a female student, focused on the necessity of the nature contrary to Fatih by not giving specific examples. She had provided a general view on the indispensibility of nature because it helps us to keep alive and supply oxygen, food and water.

Funda: *We cannot live without both livings and non-living things in nature. We cannot survive without nature. (...)Without nature, we do not have water, food and oxygen. Nature supplies these to us (5th grade).*

Parallel to the thoughts of Funda, Elif also provided an general view on why nature is important by indicating its necessity of life for humans. Just as Beren, Elif also views that nature should be protected because it is a life source for all the livings to survive. Elif stressed her views in the interview of drawing task as follows:

Elif: *If I had drawn myself in the picture, I would have drawn myself while protecting nature. I never harm nature...[Thinks for a while] If I did, maybe did it accidentally. However, I generally not harm the nature, I protect the nature because I think that nature is our life source, so it is very important. Without trees, for example, there were no oxygen. (...) If we do not care the nature, both nature and us will disappear. (5th grade, Female)*

In her interview, Elif thinks nature as a life source to survive. She mostly focused on characteristic of nature as oxygen provider with the help of the trees.

Elif: *I think nature is our life source. If there were no trees, there were not any oxygen. (...) If nature does not exist, there were no life. If we do not care about nature and if we do not know its importance, nature disappears and as a result we will disappear. (...) Nature provides us oxygen (5th grade, Female).*

By pointing out the importance of oxygen for the survival of the human, she explained how it is important to protect nature.

One of the eight grade, female students expressed the similar opinions such as being alive with the help of the nature, being able to breathing and fulling up our stomachs:

Gamze: *Thinking nature as worthless is a very ridiculous thought. Actually, nature is important because people meet their nutirions from nature. If nature is destroyed, life on Earth will decrease (8th grade, Female).*

From Gamze's views, it can be understood that she give importance to nature because humans meet their basic needs such as foods. By supporting her own ideas, she adds other point of views about what happens to humans if nature does not exist as follows:

Gamze: *If nature does not exist, ecological systems distort and foods that are provided by nature changes. As a result, humans live maximum two years. If nature is not taken into consideration, all living spaces, places where they [humans] can breathe and food sources will disappear. (...) As a result, we need nature to live. Nature and humans must live together. We are benefiting from nature because it provides us food. That is why we should not harm it. (...) Nature is important for us to live (8th grade, Female).*

She also draws attention to why to protect nature with supporting the idea of importance of nature for the lives of humans.

Similar with the views of previous students, Ezgi pointed out the importance of nature because it provides us oxygen with the help of the trees, and it is the source of water.

Ezgi: *If there is no nature and no trees, we could not breathe. We could not take oxygen. (...) We could not get water from nature. If nature does not exist, humans get harm (8th grade, Female)..*

Ezgi did not provide specific examples related to how waters and oxygen can be taken from the nature and also did not mention about the need of nutrition of humans.

Emre, to illustrate, focused on why nature is important for humans by indicating the oxygen and food needs of people.

Emre: *If nature does not exist, there will be no photosynthesis occur and CO₂ levels would increase. Besides, it is important that nature provides us food.(...) We have most of our foods from the nature. If nature does not exist, we cannot even live these times (8th grade, Male).*

As a result, his views on reasons of importance of nature was connected to human survival. He implied that if nature does not exist, humans would not keep alive until these years.

Miray, who is a female eight grade student, briefly points out the importance of nature as in the following:

Miray: *If nature does not exist, humans cannot live, cannot survive. (...) I mean...Nature provides us water (8th grade, Female).*

Miray focused on that nature is important for keeping us alive and, especially meet our need of water. She did not emphasized on other basic needs of humans that can be met by the natural resources.

For another evidence, data from interview of Arda were presented below. Additional to the importance of nature on the livings to survive, Arda pointed out the superiority of nature over humans while explaining the importance of nature, which can be categorized under instrumental value:

Arda: (...) *It will be truer to indicate that nature is greater than us. Without humans nature can live, but without nature we cannot live. That is why nature is greater than humans. (8th grade, Male)*

In the first part, importance of nature seen as life source and it can be concluded that most of the students view nature as important and indispensable because it meets their needs such as oxygen to breathe, food and water. Besides, the students shared their opinion that if nature does not exist, humans cannot survive. From these point of views, it was examined that most of the students hold instrumental values s nature as the source of basic needs for survival.

4.2.1.2 Nature for Recreation

One of the students indicated the importance of nature by focusing on the having fun in nature. She provided the reason for importance of nature as spending a nice time in nature.

Ecem, who is female, fifth grade student, stated that if natural places does not exist, people cannot be outside and have fun in nature.

Ecem: *We can have more fun when we are intertwined with nature. Nature provide us places to enjoy ourselves (5th grade, Female).*

4.2.1.3 Nature for Health

Some of the students provided the reasons of the indispensability of nature by emphasizing the positive impact of nature on both physical and psychological health. Firstly, the participants focused on how nature helps people to heal, feel better and become physically healthy.

Beren, who is a female fifth grade student, mentioned the importance of clean nature to be physically healthy by exemplifying specifically the air and soil pollution.

Beren: *Nature is important, because without it or without a clean nature, people become unhappy and unhealthy. We can get various types of diseases because of air pollution and soil pollution (5th grade, Female).*

Similar to Beren, Fatih, a male, fifth grade students, shared his experience with her mom and told how his mom benefits from nature to help her son get well and feel better when he is sick.

Fatih: Nature is very important for us for breathing, for feeling ourselves good. For example, once I get sick, my mom made me walk on the soil to make me better and healthy. I do not know why actually she is doing it.... It was something like my negativity goes into soil...Umm..Something like that. (...) Nature makes people to get better, stay healthy and to make us calm (5th grade, Male).

Fatih provided his own experience with nature and how nature helped him to get better when he is sick. From his view, it is understood that he views nature is the helper for getting better.

Ezgi explained the importance of nature by focusing on what happened if nature is not protected and destroyed. She related the destroying of nature with emerging variety of diseases.

Ezgi: If we destroy the nature, variety of diseases can emerge and spread. (...) If nature does not exist, humans get harm (8th grade, Female).

Miray, similar to Beren, indicated how pollution can negatively impacts the health of humans. She specifically indicated the air pollution as in the followings.

Miray: I think that nature should be cared and people should give importance to nature because if nature does not exist the air pollutes and it affects health. What I am saying is that it affect us negatively (8th grade, Female).

Miray provided the reason why nature should be cared and given importance by showing the connection between human health and situation of nature.

Secondly, for indicating the positive impact of nature on psychological health, some of the students emphasized that nature provides tranquility, inner peace and relaxation to themselves and some of them explained necessity of nature by saying that it is a place to take a short break of daily life boredoms.

From the fifth grade students, Ecem shared her idea for importance of nature on psychological health by indicating that nature provides her relaxation and happiness.

Ecem: *When I look outside, trees and stuff... and flowers. You know, I feel happy when a flower blooms. I become happy and relaxed just because I see these. Flowers and trees makes me feel happy. I love nature (5th grade, Female).*

Like Ecem, Beren thinks that nature nature makes people feel peace. Apart from viewing nature as away from the chaos and noise of the city life, she indicated that it brings her happiness and calmness.

Beren: *When I spend time in nature, I feel peace. There is no noise of city. Just away from city noise. I just feel happy and calm. Tranquility... So, that is why it is important for us I think (5th grade, Female).*

Deniz, who is a male fifth grade student, views nature as important because he stated his opinions as in the following:

Deniz: *Nature gave me tranquility and I feel comfortable in nature. I guess it is important to have this in those times... (5th grade, Male).*

Deniz indicated the importance of nature by sharing his feelings how nature helps to be calm and peaceful.

Ezgi, who is a female eight grade student, indicated how she feel relaxed in nature and for this impact of nature on her, she thinks that nature should be given importance.

Ezgi: *Being in nature gives people peace and relaxation. When I inhale the clear air, I feel relaxed. Thats why we should give importance to nature. For the clean air (8th grade, Female).*

Gamze, a female, eighth grade student, indicated the benefits of nature for psychological health from their own point of view and how she actually feels when leaving the city for being in a natural place.

Gamze: *When I am in nature, I think that "OK. You are out of town now, you are in a different place and you should leave all your trials in city and let yourself chill." That is why nature is important because it makes people feel relax. It has benefits for psychological health I think (8th grade, Female).*

She also added that nature increases inner peace and make people away from their unpleasant feelings and ideas by stating as follows:

Gamze: *Nature provides people peace. If people do not have nature, they are most likely to have psychological problems. If nature does not exist, negative thoughts and feelings affect people(8th grade, Female).*

When examined what Gamze said, it can be clearly realized that she views the nature as a place where humans feel better psychologically.

By looking at these views, students who stated that nature is important because it provides a healthy life were shown in this section. Both physical health such as feeling better when someone is sick, getting rid of diseases and psychological health such as being away from stress and trials of daily life, feeling calm and peaceful were attributed to the impact of nature on the humans which makes the nature as indispensable and important.

4.2.1.4 Nature for Future Generations

Three of the participants named Beren, Elif and Miray indicated that the nature is important for the future generations. They focused on the nature protection for the sake of next generations and emphasized the necessity of the nature for them.

Beren mentioned for whom nature should be protected and is important for humans. According to her explanations in the interview, Beren stated that whole world is important for the all the lives of livings and future generations. Therefore, Beren emphasized on the importance of nature and its protection for the sake of future of all livings and future generations as in the following:

Researcher: (...) *Well, what are your reasons for protecting nature and why do you think nature is important?*

Beren: *Actually, whole world and nature is important for all livings and the future generations. If nature collapses, whole livings disappear. (...) Nature is important for all of us. Therefore, for the sake of future, we should protect it." (5th grade, Female)*

As can be understood from the Beren's view, she has linked the importance of nature with the future of livings and for the sake of the future generations.

Elif, who is a fifth grade students, presented reason why nature is important and should be protected. She mentioned that nature should be protected for the sake of herself and all other humans. Views of Elif on these was provided in the following with the pieces of evidence taken from the interview:

"Elif: (...) Yes it is true [agree with the card of Stewardship]. We are responsible to protect nature.

Researcher: Well, for whom should we protect nature?

Elif: Mmm...[Thinks for a while] I believe nature is important and has been entrusted to everyone, to us from the earliest times and from people who lived before us. Therefore, we must protect [nature] for ourselves and for other people who will live after us. (5th grade, Female)

Elif explicitly focus on protection of nature from humankind itself from who harms nature and for the sake of humankind that will come after us, in a word, for future generation.

Similarly, an eight grade female student, Miray briefly and superficially indicated the reason why nature is important as in the following.

Miray: We should take care of nature because it is also important for us and for future generations (8th grade, Female).

Although there were only three students emphasized importance of nature by pointing the sake of future generations superficially, it is important to show different reason for showing the value of nature that students have.

4.2.2 Neither Instrumental nor Intrinsic Values toward Nature

Since in the literature the 'beauty of nature' is not considered in the scope of both instrumental and intrinsic values, it is examined under the category of neither instrumental nor intrinsic value. Additionally, 'God's creation' was examined under this category. In the following, how students find nature as important by considering the beauty of nature and importance because of God's creation were presented.

4.2.2.1 Beauty of Nature

Only two students, both of them female and fifth grade students, indicated the beauty of nature and linked this reason with importance of nature. Ecem indicated how nature is beautiful and supported her idea as follows:

Ecem: *I feel happy when I see beautiful places in nature because, for example, when a tourist come to our country it will be nice to show beautiful natural places. However, if trees are cut down, there is no point wondering around. Nature is beautiful, like beautiful waterfalls and stuff. (...) Without the flowers, nature would not be a good and beautiful place (5th grade, Female)..*

Similar to Ecem, Beren stated that nature is important because it is beautiful and provides a good view for humans as in the following:

Beren: *Nature is a beautiful ecosystem. Greenery and mountains... Help us to see a beautiful view. (...) Besides, nature gave us a good view. It is better than looking at the concrete buildings (5th grade, Female).*

As understood from both views of Ecem and Beren, they viewed nature as important because it provides good view and make our country more attractive for tourists.

4.2.2.2 Nature as God's Creation

Some of the students thought that since the nature is created by God, all components of it should be protected and given importance. Four students of among all participants viewed that the God entrusted nature to humans and give responsibility them to protect and care about. Since participants who indicated the nature as God's creation stated very close point of views, their interview data were provided below one by one.

Deniz: *Nature is important because it is entrusted to us by God (5th grade, Male).*

&

Funda: *God entrusted nature to us. Nature is important for us because we are responsible to God (5th grade, Female).*

&

Tunahan: *We have responsibilities to protect and see it as important because God created nature. God created it and entrusted it to us. We should take care of it. We should have responsibilities toward it. God created both us and the nature (5th grade, Male).*

Emre, eight-grade student, explained why we should protect nature by emphasizing that nature is God's creation. According to Emre, God create everything and therefore nature should be cared.

Emre: *Nature is entrusted to us as by God. It is God's creation and we should not distort the balance of nature because of it. It is important for us (8th grade, Male).*

Emre considered the protection from different point of view which is "protecting nature because God entrusted the nature" and stated his ideas as in the following:

"I believe that we should protect nature because it is entrusted to us. (...) God owes the nature to humans, in my opinion. God is the greatest and creator. It is also true that as a person I have an impact on the nature. Coronavirus, for example." (Emre, 8th grade, Male)

As understood by the interview data, Emre views that nature created based on a balance by the God, which is why he perceives that he and other people should protect and gave importance to the nature. He thinks that he has a responsibility to protect nature because God owes him nature and other people to do so.

4.2.3 Intrinsic Values towards Nature

Intrinsic value of nature was also defined in the present study as van den Born (2008) stated. Intrinsic value is own value of nature have for own, regardless of its functionality of humankind (van den Born, 2008). In this part, intrinsic value was examined under one subheading in which importance of nature is seen as irrespective to human needs and usage.

Apart from the instrumental value, which generally focused on the anthropocentric point of view, indications of intrinsic value, which is generally regarded as the ecocentric point of view, were supported by only two students and shown under this

part. Tunahan and Mehmet, who are fifth and eighth grade male students respectively, do not merely focus on the human needs, recreation and health. They emphasized the importance of nature by only emphasizing the welfare of animals and plants, not for the humans. These students viewed nature as a place of animals and plants, not solely a place of functioning for needs of humankind.

4.2.3.1 Nature for Animals and Plants

Rather than focusing on human usage and need towards nature, Tunahan emphasized that nature is for the animals. He indicated that nature is important and should be protected for the animals because nature is their home to last their lives.

Tunahan: Nature is important and should be protected because if nature is not conserved, there is no greenery left and there will be unplanned urbanization everywhere. There were no place for animals to live (5h grade, Male).

Tunahan also added that if nature is not protected and ecosystem is distorted, animals can be faced with the danger of extinction. He indicated the importance of nature for animals by giving the rationale such as threat of extinction.

Tunahan: It is important to conserve natural setting because nature is important for animals. If there were no green area, habitat of animals disappear. Ecosystem will distort. (...) If nature is not protected, animals will extinct. For this reason, nature is important for animals (5h grade, Male).

As understood from data provided by Tunahan, nature is seen as important irrespective of its benefits for humans. Tunahan only focused on indispensibility of natural environment for the lives of animals.

Mehmet generalized the importance of nature for all living things, not just humans by stating:

Mehmet: If nature does not exist, most of the livings could die.

Interviewer: Why do you think so?

Mehmet: Because... Imm... For example, fish needs sea to live. However, as the seas were not protected and polluted day by day, fish get poisoned too.

(...) We should take care of nature for all of the animals not just humans. I see nature important because I want all living things alive. To keep the livings alive, humans should take care nature (8th grade, Male).

Although Mehmet gives specific example by indicating the animals, at the end he expressed the necessity of nature for all livings. He did not consider the function of nature for people.

4.2.4 Summary of Values of Nature

All in all, all of the students viewed nature as important and indispensable. When the reasons were analyzed why students view nature as important, overwhelming majority of them attributed instrumental values such as for survival, for health, for recreation and for future generations. Furthermore, a pattern was detected that most of the students perceives that the nature is a life source for humans and other livings. Without the nature, they think that they cannot survive as stated by the students. In other words, it was identified that most of the students, regardless of the grade levels, thinks that they cannot live without nature and they depend on nature to survive that is why the nature is greater than they are. Moreover, only two of the students mentioned intrinsic value of nature in their interviews. Eventhough they do not use the term ‘intrinsic value’ explicitly, regardless of functionality of nature for humans, they mentioned that nature is for animals and plants, and they did not emphasize on the humans.

Overall, analysis made and reasons given by the students were provided in the Table 4-5

Table 4-5 Summary of Values of Nature

Name of Participants	Instrumental Values				Intrinsic Values	Neither Instrumental nor Intrinsic Values		
	For survival	For recreation	For physical health	For psychological health		For future generations	Place of Animals and Plants	Beauty of nature
Beren	X		X	X	X		X	
Elif	X							
Tunahan								
Deniz				X		X	X	X
Fatih	X							X
Ecem	X	X	X	X			X	
Funda	X							X
Arda	X							
Mehmet						X	X	
Emre	X							X
Gamze	X							
Miray	X		X	X	X			
Ezgi	X		X	X				

4.3 Middle School Students' Images of Human-Nature Relationship

In this part of the study, views of middle school students regarding humans' appropriate relationship with nature were investigated. The following research question guided the present study in the context of images of human-nature relationship.

Research Question 1.3. What are the views of students related to the human-nature relationship?

Research Question 1.3.1 How do middle school students view their own images of human-nature relationship (HNR)?

When the analyses were completed, it was found that the participants of this study view proper human-nature relationship type mostly as *"Stewards of nature"*. Following this, image of relationship *"Partnership with nature"* was the most chosen typology after *"Steward of nature"* among all participants of the study. *"Participant in nature"* and *"Nature Distant Guardian"* were the least chosen typologies for views of students regarding their own ideas on human-nature relationship types. None of the students perceived Master, Apathy, and User as their views on images of relationship when data was analyzed holistically. Nevertheless, one of the male fifth grade participant select himself as "User" in card selection task. However, as data was analyzed and presented based on most frequently phrases related to the types of human-nature relationship, phrases of this participant were matched with mostly with the type of *"Partner with nature"*.

In the following parts, first, whose images of relationship with nature identified as 'Stewards of Nature' was examined. Second, 'Partnership' type of human-nature relationship was provided with the supportive evidences from interviews. Afterwards, students whose ideas approximated to the type of 'Participants in Nature' was presented. Lastly, the eighth grade student who hold the idea of ideal relationship of humans with nature as 'Nature Distant Guardians' was investigated.

4.3.1 Stewards of Nature

In this part, students, whose types of human-nature relationship are “*Stewardship*”, were investigated. The mostly emphasized big idea of these students were the “protection of nature.”

The students whose views on relationship with nature reflect the characteristics of Stewardship type were presented by showing evidences from the interviews completed in all three tasks, but mostly from the ‘Card Selection’ task was used when analyzing the data. According to the analyses, three fifth grade students and three eighth-grade students were shared views on their image of relationship as Steward type. Picture and thought balloon of the Stewardship can be found in Figure 4-4.



Figure 4-4 Card of Stewardship Type

In order to show evidence how these six students presented their views regarding relationship with nature as Stewardship type, interview data of the participants were analyzed. The findings received from the interview data of the students were gathered under four main ideas such as (i) Humans should take care of nature, (ii) Humans should be responsible to protect nature, (iii) Humans have an impact on nature, (iv) Humans should use technology for the sake of nature.

Four main idea that is emerged from the interview data comprises the characteristics of the Steward type. Views of students which supports all or most of these main ideas categorized as Steward type. The quotations of students that shows their own ideas approximated to Stewardship type were provided in the following subheadings.

4.3.1.1 Protection of Nature

In this section, students whose ideas reflected that humans should protect the nature for establishing an ideal relationship with nature was presented. Beren, to illustrate, provided evidences related how nature should be protected. She generally underlined the welfare of plants and animals and how to be treated them in order to protect the nature by stating:

Beren: *As humans, I and others can create natural life parks. (...) When saying natural life parks, I mean that there can be created forests when we plant lots of trees. As forest is one of the biggest ecosystems, lots of living things can live there.(5th grade, Female)*

She focused on planting trees and creating natural environment for protecting the livings and providing them nests as a way of protecting nature. In relation with this, Beren mentioned how to protect nature by pointing out the houses of humans and how these houses should be constructed to protect nature. To explain her views she mentioned as in follows:

Beren: *We can build adequate number of houses for the human population, not build excess amounts. I saw in a book that there were sustainable home designs that benefited from solar energy, also they are not so big that took a bigger place and cause deforestation. It is enough for me to live in a house just like capsule, in this way not too much space is deforested and there is no need to cut trees. I can plant trees and provide nests for animals. (5th grade, Female)*

From her interview data, it was identified that she suggests a way to build more sustainable and storable houses in order not to cut trees and in this way, protecting nature. While she mentioned the sustainable home designs, she also suggested usage of renewable resources for preventing loss of forests to create bigger places for

bigger homes. Apart from these, while mentioning the protection of nature, Beren expressed renewable energy sources, recycling, hunting bans, decreasing greenhouse gas emission to describe how she can protect the nature. Examples that she provided were presented in the following:

Beren: (...) Humans lean on the fuel coals or petrol for producing new products and meet their needs of heating. To me, for preventing this, renewable energy resources can be used and recycling can be done. We should not pollute the nature. (...) For example, I am not polluting and I give my papers to my mom and dad to recycle them in their working place. (...) If we recycle, air is polluted less than today. (...) I am not throwing garbage to the ground. I try to protect nature by doing these. (5th grade, Female)

Addition to these, she illustrates how to protect wild life by mentioning hunting bans:

Beren: To protect the wild life, as I mentioned, natural parks can be constructed. For example, in Turkey, bald ibis is on the verge of extinction because, I guess, humans hunt them for their fur. Therefore, to protect them, hunting ban regulations can be introduced. (5th grade, Female)

Furthermore, Beren pointed out the importance of being conscious towards the nature. Therefore, she emphasized that as a way of protecting nature, raising the awareness of the public towards the nature protection. She summarized her thoughts as follows:

Beren: I think some of the humans harm nature because they do not know how nature is important. (...) They are unaware, if they know they may not act in a harmful way. That is why; raising the awareness of people can help nature. (5th grade, Female)

Elif, who is another fifth grade female students and view appropriate relationship with nature as Stewardship, explains their ideas related how to protect nature by planting trees and not throwing garbages on the ground. In the interview of the drawing, when it is asked where she would like to draw herself in the picture, she answered as in the following:

Elif: I would draw myself as planting trees. Except this, I would draw myself while I am picking up the garbages on the ground eventhough those garbages are not mine. In a word, I will not refuse to take the garbages just because the garbages belong to someone else. (...) We can donate to the organization

to plant trees and can adopt animals from the animal shelters. (5th grade, Female)

From her interview, it can be identified that she found a way to protect nature by not polluting nature with garbage and planting more trees.

Additionally, from the interview data of drawing that taken out, it was identified that Tunahan views himself as Steward type. According to him, in the drawing task, if he would draw himself, he would like to draw himself while cleaning the ground and picking up the trashes in the greenery place. To prevent nature being harmed, Tunahan addressed some ways like in the following:

Tunahan: *We can protect nature by not throwing garbage on the ground, by saving on energy, by feeding animals, irrigating plants, growing a fruit tree (...), and by leaving the area as found it. (5th grade, Male)*

An eighth grade student Arda approached the Stewardship type from different point. He did not emphasize on the actions for protecting nature, rather he underlined the benefit of lack of human actions in nature and added that by doing nothing, we actually protect nature:

Arda: *We cannot protect nature by doing something, rather we can protect nature by doing nothing. (...) Because, we create butterfly effect on the nature. If we did something, it creates bigger consequences. (...) Actually, we can protect the nature by not harming, so by doing nothing is enough for nature. Even though we do not do favor to nature, nature protect itself, renew itself. (...) If we do not destroy all the trees in the world in an uncontrolled way and if needed, by cutting less, nature gives us back too much more. (...) For example, as I said, these fossil fuels, for example, if we do not release the wastes from the factories to nature, we will both protect nature and contribute something to nature. That is, we make sure it protects itself. (8th grade, Male)*

Arda provides further evidences related how nature can be protected by humans without harming and by ‘not’ doing anything as in the following:

Arda: *If one person picks up the trash and throw it in trash bin, nature can renew itself. So, one can protect nature by not throwing trash to the nature. I had never harmed nature before. For example, I do not throw trash on the ground. To exemplify, some humans spit on the floor, I never did that. I generally pick up the trashes that I saw. For example, when my friends throw*

garbage, I pick it up. (...) For example. Fossil fuel should not be used, instead people can benefit from biomass or animals' wastes to produce energy. In this way, humankind can be beneficial to the nature. (8th grade, Male)

Like Arda, Emre thinks that humans are harmful factor of the nature. He views that if humans do not do anything, nature renew itself. Additionally, he provides examples for this situation in the context of COVID-19. The quotation, which is received from the interview of the drawing data can be seen below:

Emre: *With the emergence of COVID-19 pandemic, humans helped nature by not doing anything. With their absence in the nature, it renewed itself. (...) In my opinion, COVID-19 made humans realized that with their absence nature renewed. For example, now, I am looking out for nature much more than ever for keeping clean the Earth. (...) For example, I do not throw the trash on the ground; never leave the picnic area without cleaning it. (8th grade, Male)*

Emre also pointed out how to protect nature by stating that factories could attach filters to their chimneys and to exhaust ports of cars.

Other from this, Mehmet thinks that by saving energy, not throwing garbage on the ground and without polluting the forests, nature can be protected.

Mehmet: (...) Humans can nature with energy savings, without throwing garbage on the ground, without destroying forests. (8th grade, Male)

To summarize, these students focused on the idea that humans should protect nature by supporting the characteristics of Stewardship type.

4.3.1.2 Responsible from Nature

Views of students, which were approximated to the idea that ‘humans are responsible to protect’, were presented in the followings. Beren emphasized that she has a responsibility to protect nature. The reason why she wants to protect nature is that the ones who pollute and harm nature are humans, so as humans they have a responsibility to protect it. If as a human she does not take the responsibility now,

she views that in the future the planet can be worse in situation than today. Beren expresses her thoughts like in the following:

"Beren: (...) We [all humankind] should feel responsible to protect nature.

Researcher: Why do you think that protecting nature is a responsibility of all humankind?

Beren: Because it is us who pollute the Earth, thus, it should be me and others who should take responsibility to protect it. (...) I and other people can have an impact on nature both in a good and bad way. We can be dangerous for the nature as said in here [card of Stewardship](...) We put it [nature / Earth] in a bad situation, that is because we should fix it. "(5th grade, Female)

Mehmet, as a last eight-grade student who feels close himself to the Steward type, indicated reason of protecting nature because he saw the nature as a life source, like other Steward participants. He also expressed himself by indicating the lives of other livings. He views that in order to make other livings survive, humans should protect nature. His interview data for providing evidences can be found as follows:

Furthermore, Mehmet emphasized that nature should be protected because of the welfare of all the livings. He added that if conscious people do not protect nature, bad people continue to ruin nature. To prevent this situation, he suggested protecting nature for the sake of all livings and from the bad people who harms nature. His explanation from the interview was presented below:

Mehmet: I think we are responsible to protect nature because if we do not protect it, some other people comes and ruins nature. We should protect nature from them and for the lives of every kind of living, to make them keep survive. (...) We should not interfere the lives of other livings." (8th grade, Male)

As a result, from the views of Mehmet, it was identified that in his opinion, nature should be protected because nature is a life source and by protecting it, we can provide other livings to keep survive and prevent other humans to ruin nature.

4.3.1.3 Impact of Humans on Nature

According to Arda, who is an eighth grade student, nature should be protected because humans have an impact on nature, which is mostly a bad impact. He defines a phrase to explain what he perceives related to the protection of nature as in the following:

Arda: *In my opinion, all of the humans have an impact on the nature. Like a butterfly effect, in other words, a little effect done by humans can create a huge problem in the nature. Butterfly effect symbolizes why we, as humans, should protect nature. (...) Because like the butterfly effect, when a little impact of one person, other livings and humans can be affected."* (8th grade, Male)

Apart from this, he supported with his sentences that he has Steward type. From his words, he never harms the nature and gave example by saying that he never threw garbage to the nature. To conclude, he saw humans as harmful factor because their actions –even if a little- can cause huge problems; therefore, he perceives that the nature should be protected from humans themselves.

4.3.1.4 Technology for the Nature

Students who view the human-nature relationship as Steward type support the idea that technology and technological tools can be used for the sake of the nature. Beren pointed out the technology usage of humans for a reason to protect nature. According to her views, humans are using technology to alter nature and it can bring to an end of the world. According to her, nature should be protected by the humans and against the usage of harmful technologies.

Beren: *Technology... Well, technology is used to alter nature by the humans; however, using technology as it is today can finish us. That is why we should protect nature against the harmful technologies.* (5th grade, Female)

She emphasized that technology can be used for minimizing the negative effects of humankind on nature. Thus, Beren, who has a type of Stewardship, presented a way to protect nature: ‘by using technological advancements for the welfare of nature’.

According to her, if humankind use technology for the welfare of nature, nature is never polluted. She provided several examples related to how one can protect nature by using technological advancements as in the following:

Beren: (...) *Technology can be used to welfare of nature. For example, humans can build water treatment facilities for waters, they can keep clean the air by attaching filters to the chimneys of factories. Again, with technology, electric cars or cars powering up with wind energy, solar energy or even hydroelectrical energy can be constructed. Besides, humans can generate electricity from the renewable sources. In these ways, nature won't be polluted. (5th grade, Female)*

Arda also added technological advancements can be used for the welfare of nature. He gave examples as in the following:

Arda: *We can use technology to make nature better such as using environmentally friendly electricity generating machines, like using machines that clear soil. (8th grade, Male)*

Lastly, Mehmet explained how to protect nature by focusing on the usage of technology for the welfare of the nature. He provided examples from the real life cases like in the following:

Mehmet: *People can take care of nature by using technological tools. For example, by using agricultural machines, someone can plant trees and can sow much more than without technological tools. In this way, people enables other livings, birds for example, more space to build a nest. (8th grade, Male)*

Mehmet superficially support the idea of protection of nature in his interview all the time; however, the technology for the welfare of nature was emphasized dominantly in Mehmet's interview as in the following:

Mehmet: *We are advanced living beings as humans and we should protect the nature in order to help other livings to survive. (...) Humans should use technology for the sake of nature, without exaggerating. (...) For example, with the technological tools, one can sow much more seeds to the soil at a time. (8th grade, Male)*

Emre who is an eighth grade male student, states his explanations toward technology for the welfare of nature by providing specific examples:

***Emre:** Technology can be used for the welfare of nature. For example, when there is a forest fire, with the help of the technology we can call the fire department. The forest could be ash if technology was not given importance. We should benefit from technology to help nature. (8th grade, Male)*

Apart from their explanations related to how technology can be used for welfare of nature, some of them add slightly different opinion. Although Elif, Tunahan and Mehmet think that technology can help nature for its welfare; yet, they express that technology never be enough for make nature same with purity and original as before. Since this view is very close to the idea of ‘technology for the welfare of nature’, these views of students were examined under this section.

Elif, Tunahan and Mehmet shared their opinions related how technology become limited to reconvert the bad situation of nature to pristine status. They mentioned that the originality and purity of nature were deteriorated because of the usage of technology, eventhough it is used for help to the nature. Interviews of students can be found below:

"[While examining card of Master card] We should not use technology to alter nature, not everyting can be fixed with the technology and money. Although we are trying to help to the nature with technological developments, we cannot bring back the natural assets and habitats with the money and technology. Although humans try to fix it, it will never be the same." [Elif, 5th grade, Female]

"We cannot bring the nature back its original, pure state with the technology and money. Nature has its own pure ingredients. Money and technology cannot provide these ingredients, eventhough humans try to help nature" [Tunahan, 5th grade, Male]

"Even though regulation for nature made with the help of the technology helps the nature, however it is never be the same what nature has before. It will never be the same and original as before." [Mehmet, 8th grade, Male]

4.3.1.5 Summary of Stewards of Nature

To sum up, the students who views their relationship with nature as Stewardship emphasized in their interviews that

- (i) they should protect nature for the sake of planet, for other people, for animals and for the future generations.
- (ii) they feel responsible that nature entrusted to them from God, from other humans who live in the past and from animals.
- (iii) technology can be used for welfare of nature.

Stewards of nature used phrases that indicating protection of earth, livings, future of the planet. The phrases used by the participants who were detected as Stewards of nature and that took out from interview data can be seen in the Table 4-6.

Table 4-6 Codes and Phrases of Stewards of Nature

Code	Phrases of Steward of Nature
Taking care of nature	not harm nature not create pollution (air, soil and water pollution) not build houses recycle attach filter to factory chimneys afforestation/plant seeds/trees/sapling raise awareness of people not throwing trash/pick up trash feed animals not harm animals not cutting trees prevent hunting not picking up flowers provide nest for animals (i.e. natural life parks) not walk on the flowers and grass use renewable resources (use clean energy) nature is our home

Table 4-6 (cont'd)

Code	Phrases of Steward of Nature
Technology for nature	use technology for welfare of nature
Responsible to protect nature	protect nature from bad people protect nature for future generations /other people feel responsible to protect nature
Impact on nature	impact on nature effect on nature both good or bad

4.3.2 Partners with Nature

Students as “Partners with nature” made emphasis on the equal value of human and nature and their symbiotic relationship with each other. What is meant by phrases “*equal value*” and “*symbiotic relationship*” can be visualized as in the following Figure 4-5.

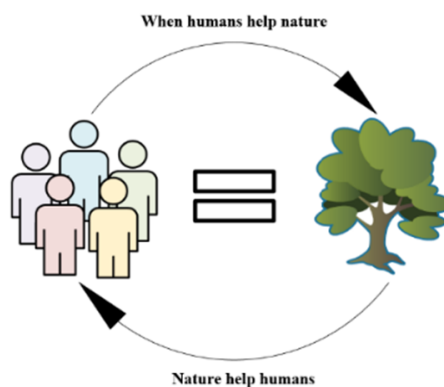


Figure 4-5 Equal Value of Human and Nature and their Symbiotic Relationship

The symbiotic relationship leads students to view that if this reciprocity between nature and humans are disturbed, humans cannot live and some vital problems may

arise in the lives of both other living things and humans. In other words, students, who hold the type of *Partner*, view that they and nature have an interdependence. In the Figure 4-6., the card of Partnership type can be seen which is shown to the students during the card selection task.

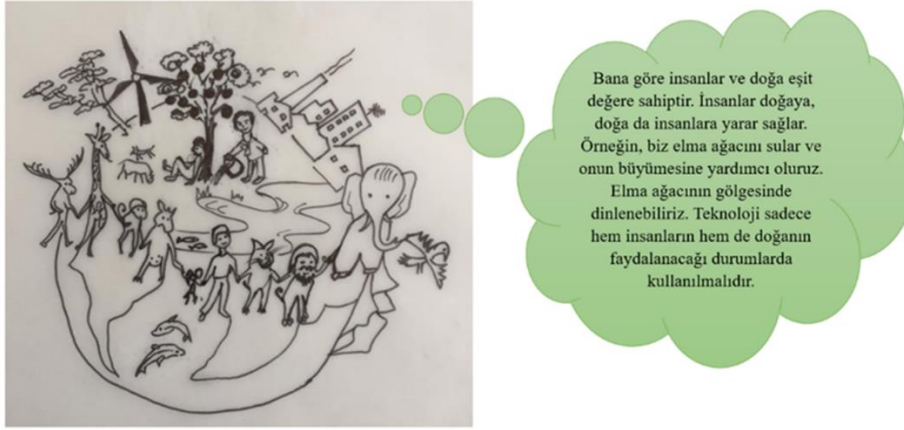


Figure 4-6 Card of Partnership Type

According to the analyses, four participants expressed their relationship with nature as Partners. The views on Partner type of these four students were presented in the following, under three subheadings which corresponds to three main views about *Partner* type. Interview data of the students were analyzed as (i) Humans and Nature have equal values, (ii) Humans and Nature are interdependent, and (iii) Technology can be used for welfare of both humans and nature.

4.3.2.1 Equal Value of Human and Nature

According to the students who embraces the view that nature and other livings in the nature share the same rights and same world, human-nature relationship is viewed as equal value.

Fatih, who is a fifth grade student, shared his opinion by focusing on the equality of the nature and humans. His perception and evidence that he used the phrases matching with the characteristics of Partnership can be found below:

"Researcher: *Are humans superior to the other livings?*

Fatih: *Absolutely not. We are equal.*

Researcher: *Why do you think that we are all equal?*

Fatih: *We are all living beings. We can do whatever we want, we are free, so what I am saying is that someone cannot be superior to some other one. We all have same right to live. For example, animals are very tired and cannot walk anymore, but there are people who force them to walk. But they should let go these animals and so, they can do whatever they want." (Fatih, 5th grade, Male)*

Like Fatih, Funda also stated that all livings are equal; however, she explains the reason in a different way:

Funda: *Humans and other livings have equal value as we all created by God. That's way we all have equal value. Well, for example, let's say... I believe that we have equal value, but we did eat fish, but fish do not eat us. Although I believe that we have equal rights, we do not treat them as we have equal rights. (5th grade, Male)*

Although Funda thinks that all livings have equal value because we all were created by God and equal rights were given to us, she indicates that humans do not show and apply it in real life.

Addition to these students, Ecem, a fifth grade student, mentioned the equality between the nature and humans by commenting on the card of Partnership type:

Ecem: *All kinds of living things were in the card, there is no superior kind over another. In my opinion for example we should not love one animal kind over other, we are all equals like illustrated in the card. (5th grade, Female)*

Miray explicitly uses the phrases that leads researcher to categorize her under the Partnership. She was the only student that select her idea of relationship with nature as "Partners with nature". In the following, evidences received from the interview data of Miray was presented. Miray mentioned the equality of human and nature:

Miray: *Actually, we should responsible from ourselves, because if we do not act responsibly to nature, the harm will again be on us. Actually on the future generations. (...) [While examining the Master Typology card] I think it is not superior to living and non-living beings in nature because if they do not exist, I cannot live and they cannot live without us either. Then it is not superior. I believe, we are equal. (8th grade, Female)*

4.3.2.2 Mutualistic Interdependence between Humans and Nature

In this section, students viewed the human-nature relationship as Partnership emphasized on how humans and nature are interdependent to each other in a mutualistic way. They generally stated the reciprocity of welfare between humans and nature and how they establish a symbiotic relationship with nature.

Other than focusing on the equality of the humans and nature, Fatih indicated the mutualistic relationship between the humans and nature by giving examples by stating:

Fatih: *We did good things to nature, so nature give us good things. For example, like hat [pointing out the man who irrigates the apple tree in the Partnership card], we are watering the trees, then trees are growing, then we can sit under them and eat their apples. If we benefit nature, nature benefits us. (5th grade, Male)*

Fatih additionally addressed that if humans help nature, nature provides it help to humans more by indicating:

Fatih: *Humans cultivate the farmland, then they produce food and stuff. I mean, we do good things, help nature, planted like here, nature gives us more trees and products than before. (5th grade, Male)*

In the views of Fatih, he pointed out the idea that humans help nature and nature answers by providing more trees and products.

In addition mentioning the equality of the humans and nature, Funda also indicated the mutualistic relationship by expressing that humans and nature are dependent on each other to keep alive.

Funda: *[While examining the Master typology card] As humans, we are not the superior over nature and they are not superior over us. Without us, they*

could not survive, without them we could not live. Well, if we did not feed them and raise them, they could not survive, On the other hand, if they didn't provide us eggs milk, etc., we wouldn't be able to live this time, so we're equal and we depend on each other to survive." (5th grade, Female)

She added further evidence for the reciprocity between the nature and humans by stating that:

Funda: *It is true that nature provides us natural resources, our foods; however, if we had not watered them and would not have made any contribution, they might not grow. So they start to grow, as long as we watered them. If we put them in an environment with no sun, it cannot provide us anything good unless we looked after it. So I don't think only nature provides it, I think we have influence and benefit on the nature too." (5th grade, Female)*

Funda stated her views by indicating how humans and nature are dependent on each other by providing examples.

Moreover, Ecem, who is one of the fifth grade female, indicated the mutualistic dependence very clear and explicitly:

Ecem: *I believe we cannot be exist without nature because we benefit from nature a lot. What I want to say is, we meet everything and our needs from nature, but if we do not exist, for example, if we do not feed animals, not give water to them and trees, and if we do not take good care of them, nature will distorted and disappear. Thus, we are taking care of nature, we feed animals, we are trying to grow beautiful plants so that everyone can benefit and help each other. What I am saying is that I think nature also needs us, because as I said they also need water despite it rains, if it is an arid climate, plants still will need us to water them, because it is not good for plants when it is too hot or too cold. We should know the value of nature and help them. (...) If we do not take care of nature, we cannot produce wheat, make breads. If we use water excessively and distort rivers, we cannot meet our need of water and every person dies as they cannot drink water. We cannot also meet our need of nutrition. Let's say we found food, but we do not have even a shawl to protect us from cold. What I am saying is, we cannot survive if we destroy nature. (...) If we help nature, they will help us. (...) How much we treat nature in a better way, that much nature can benefit to humans. (5th grade, Female)*

Ecem thinks that nature depends on humans because humans irrigate the soil, feed the animals; similarly, in return, humans depend on the nature to survive, to meet their basic needs. She perceives that if either one of the ways of this reciprocity is

distorted, both humans and nature can be affected from the situation in a negative way.

Additionally, Miray gives clear examples and underlined the symbiotic relationship as in the following:

Miray: (...) *It is necessary to pay attention to nature, because if nature does not exist, the air will be polluted, it will affect my health, then nature is affected in a bad way. However, if we behave well, nature will be fine too. Indeed, everybody, nature and people benefit from each other to help each other. (8th grade, Female)*

From the Miray's answers, it can be clearly identified that she has characteristics of Partnership typology.

4.3.2.3 Technology for both the Humans and Nature

In the third section of Partnership type, students who are Partners view different point and perceives that technology can be used when both humans and nature can benefit. Ecem, to illustrate, thinks that technology can be used for the welfare of both nature and humans as stated in the following:

Ecem: *I also need technology for nature. Just as we use phones or computers to meet, to call each other, nature requires technology maybe not a computer or phone, but, for example, if animals get sick, new vaccine methods can be found from computers. In a word, without computers no vaccine is found and they get sick and die. That's why they also need technology like we do. If we develop them and behave well to them, we will benefit each other better with technology. (5th grade, Female)*

From this interview data, it can be concluded that she perceives the mutualistic dependence can be enhanced with the help of the technology.

4.3.2.4 Summary of the Partners with Nature

As understood from the evidence received from the interview data, Funda showed the characteristics of the Partnership by stating that nature and humanbeings are

equal value, depend on each other and have mutualistic relationship to survive. For these reasons, Funda is identified for her type as Partnership when asked to choose which card is approximated to her own idea of human-nature relationship. Ecem, to conclude, views herself as Partner because she thinks that humans and nature are equal and they dependent on each other and benefit from each other like a win-win situation. Other than that, she pointed out the technology usage by underlined the benefits of technology for both humans and nature. Fatih also stated the equality of humans and nature and how humans and nature depend on each other by giving example of farming of humans and in turn help of nature to humans by suppling products. Miray expressed her views on mutualistic relationship between humans and nature and how they have equal value. Miray also perceived that technology can be used when it is used welfare of both humans and nature.

In conclusion, students who view their relationship with nature by using phrases like "mutualistic relationship" and "equality" were identified as Partners. They view proper relationship with nature, as "I should help nature, because nature help me". Therefore, these students who sees themselves Partners with nature emphasized in their interviews that

- (i) they have equal values (humans and other livings are equals),
- (ii) they have symbiotic relationship with nature (in a word, when human help nature, nature help humans),
- (iii) technology can be used for welfare of both humans and nature.

In order to categorize the student as partners with nature, mostly used phrases can be seen like in the following Table 4-7. were examined.

Table 4-7 Codes and Phrases of Partner with Nature

Code	Phrases of Partner with Nature
Having equal value	equal rights of living nature and humans have equal value all livings are same do not dominate fifty fifty (nature is) not the servant of humans share the same world live in the same world
Interdependence to each other	symbiotic relationship dependent on each other mutual dependence balance of nature win-win reciprocity of welfare help each other as they need each other when nature harms, I am hurt.
Technology for humans and nature	technology for both welfare of humans and nature

4.3.3 Participants in Nature

Under this part, students, who are “Participant in Nature” as their own idea on relationship with nature were examined. The views of these students were the “affection toward nature” in a general sense. In the Figure 4-7. given below, card of Participant type that was shown to the students during the task of card selection can be seen. From the analyses of interview data, it was found that two of the students

view human-nature relationship as Participant type. One of the students is Deniz, who is a male fifth grade student; other one is Gamze, who is a female eighth grade student. Their own views that are approximated to the image of Participant was presented in the following.

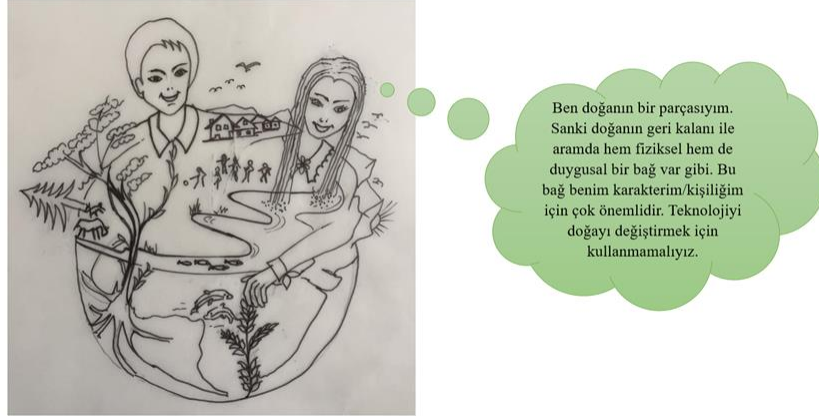


Figure 4-7 Card of Participant Type

Deniz, who is a fifth-grade, male student, create bonds between him and nature both physically and spiritually in the ‘Nature Trip in Minds’ task. In this task, where he visualized himself in nature, he presents affection and use words such as loving them, being friend with them.

Deniz: *In my imagination, there are birds on the trees, they are singing for me, they sing beautifully. Then, I was playing with the weasels and moles, I was loving them. Then, I was trying to hold the birds on the trees on my hand... actually on my finger. I tried to keep bird on my finger. (...) I was so peaceful there. It is just felt like I was bonding with the nature, with the animals there. (...) Animals, there, come near to me and my friends, we were playing and they were falling a sleep near the camp fire. Just as I said, we were like friends. (5th grade, Male)*

Deniz explicitly indicated that he was creating bond with the nature and love the nature without thinking its own profit or waiting for reciprocity. His affection toward

nature can be understood his phrases such as bonding with nature, loving animals and being friends with animals.

When card of the Participant with Nature was showed to the Deniz, he immediately answered like in the following:

Researcher: *Let's examine this card Deniz [the card of Participant type]. What do you think?*

Deniz: *It is exactly just like me!*

Researcher: *Huh, why do you think so?*

Deniz: *Because as a person who loves nature, I believe that we should create bonds with nature both physically and emotionally. (5th grade, Male)*

Besides, Deniz thinks that technology can be used but, it changes the originality and purity of nature at the end. His views on technology and usage in the nature can be seen below:

Researcher: *(...) But, earlier you said that technology can be used for welfare of nature by constructing quick tree planting machines...*

Deniz: *Yes, but I am saying that these can be the solutions for nature, but this will not completely solve the problem, because with technology world does not be like before. The world become a different place (5th grade, Male).*

As can be seen from the views of Deniz, although he thinks that technology can be the solution and be used for the welfare of the nature, the world never be the same.

As a further evidence to these quotations, Deniz selected his typology as Participant in the card selection task.

Among the eighth graders, Gamze, who is the only female student was analyzed as 'Participant in Nature', since she generally mentioned how she feel the nature, how listen the sound of nature, how love nature and animals, how she and her family discover new natural places. She explicitly shows an affection toward nature by stating:

Gamze: *(...) When I go to nature, I love to listen to and see the sounds around and I think nature has very good blessings and they are very beautiful. I love them. (...) I think, there has to be physical connection with nature. But also*

there's an emotional connection, I think it's spiritual. There is a rule to be a spiritual bond with nature in my opinion... Relaxation, tranquility... You can only find these feelings when you are in touch with nature in the present moment. This bond is very important for my character and personality. Yes, I think being with nature is also equivalent to the development of character. When people are intertwined with nature, I think their tolerance increases more. Because nature is intertwined with each other, I think that the feeling of helping each other will increase. Well, when humans see ants helping each other and when they see birds flying with each other, they learn from nature to be good." (Gamze, 8th grade, Female)

As a further evidence, Gamze selected the card of Participant type in the card selection task, when it is asked to her that which one of the cards, she feel herself closer. By stating the further evidence:

Gamze: *I feel close to myself this picture and thought balloons [by pointing out the card of Participant typology], because people in the picture are interwined with the nature and not harming the nature. These people has learned how to live hand I hand with nature. I am feeling myself like them. I am also in an interaction with nature and trying to feel the nature. " (8th grade)*

4.3.3.1 Summary of the Participants in Nature

In summary, the students who were identified as Participants give clues by indicating following phrases and sentences:

- (i) they love being in nature, love natural areas, love other livings and observe them.
- (ii) they feel affection and friendship with the natural assets.
- (iii) they perceive that technology is harmful for nature.

Participant in nature uses phrases shown in the Table 4-8.

Table 4-8 Codes and Phrases of Participants in Nature

Code	Phrases of Participant in Nature
Affection toward nature	affection toward nature wishing nature to be wider being in nature makes me happy innate bond bond between nature (physical and spiritual) love nature/trees/animals be friends with animals
Superiority of nature	Mother nature can rule itself, not humans.
Technology harmful for nature /Distort purity of nature	no technology in nature the originality of nature disturbed with technology not will the same as before not use tech to change nature not interfere nature with technology

4.3.4 Nature Distant Guardians

In this section, view of the student who has the idea that human-nature relationships is like the characteristics of Nature Distant Guardian (NDG) were presented. Similar to the definitions in the literature and the phrases that students used in the interview, there is found big idea as “protecting nature from city/home” for the Nature Distant Guardians. Card of NDG presented in Figure 4-8.



Doğayla iç içe olmadan da doğayı korurum. Bana göre evde evcil hayvan beslemek, sosyal medyadan doğa hakkında paylaşımlarda bulunmak, yere çöp atmamak, enerji tasarrufu yapmak gibi davranışlar da doğayı korumak için yeterlidir. Şehir yaşamını bırakmadan da doğanın bir parçası olabilirim.

Figure 4-8 Card of Nature Distant Guardians

By considering the interview data, there was only one eighth grader identified as Nature Distant Guardians. Ezgi provided evidence that fits with the characteristics of Nature Distant Guardian (NDG) and selected the card of NDG type because it is the closest view that fits in their own perceptions in the card selection task.

Ezgi views herself as Nature Distant Guardian; however, Ezgi mostly pointed out the place of technology in our lives. She views that without leaving the city, with the help of the social media, nature can be protected. Ezgi generally stated that without technology -for instance, social media- humans cannot live. Besides, she thinks that humans get used to live in cities. She explains these ideas as in the following:

Ezgi: *This picture [in the card of Nature Distant Guardian typology] is true for me. Everybody is hand in hand with the technology, yet they can protect the nature. This is important for us. In here [in the card of Nature Distant Guardian typology], both technology is used and nature is protected at the same time. This is a balanced situation for the life style of humans live in the cities I guess. Besides, it is more healthier to protect nature from home. (8th grade, Female)*

Additionally, since Ezgi selected the card of Nature Distant Guardian type, she explained why she chose it like below:

Ezgi: *Totally, this cards reflects my opinions, because technology exist there and was used, but nature was not harmed. They can use technology for interacting with nature. (...) It is more suitable to use technology for studying about nature. (8th grade, Female)*

Ezgi also provides examples what she is doing at home to protect nature like in the following:

Ezgi: *I do not harm the living creatures, not cutting trees, I am watering the plant; I am saying that I can protect nature while living in the city, I can be a part of nature. It is so true. (8th grade, Female)*

As understood by the interview data of Ezgi, she views herself living in the nature while at the same time protecting the nature with the activities like recycling, feeding animals, using technology for the benefit of nature.

4.3.4.1 Summary of the Nature Distant Guardians

There was one student identified which is viewing that nature can be protected without interact with it and without leaving the urban life style. Ezgi generally preferred not to intertwine with the nature. She exclusively engages with the nature via social media advertisements and campaigns, and applying organizations, which protects nature behalf of them. Ezgi stressed the ideas as in the following.

- (i) protection of nature without leaving their home,
- (ii) protection of nature via social media sharings and institutions for nature.

The phrases that used by the Nature Distant Guardians can be seen below Table 4-9.

Table 4-9 Codes and Phrases of Nature Distant Guardian

Code	Phrases of Nature Distant Guardian
Being distanced from nature	distanced from nature not hand in hand with nature but love nature not too much interaction with the natural assets cannot live without technology/ not keep away technology quite a while
Protection of nature from city/home	we are suitable for city life living in city life, not in nature with social media raise awareness we can protect nature from home

4.3.5 Summary of Students' Own Images of Human-Nature Relationship

To summarize how the students in this study perceives their relationships with nature by considering the typologies, Table 4-10. were provided below.

Table 4-10 Summary of the Students' Own Images of Relationship

Nickname \ Typologies	Steward	Participant	Partner	NDG
Beren	X			
Elif	X			
Tunahan	X			
Deniz		X		
Fatih			X	
Ecem			X	
Funda			X	

Table 4-10 (cont'd)

Typologies Nickname	Steward	Participant	Partner	NDG
Arda	X			
Mehmet	X			
Emre	X			
Gamze		X		
Miray			X	
Ezgi				X

According to the analyses made, the researcher has reached two main conclusions regarding the types selected by the students to show their own views on images of relationship with nature. Third and fourth idea emerged related to nature and usage of technology by humans was presented below, as technology is found in the characteristics of HNR types.

- (i) **None of them is Master, Apathy or User:** None of the students perceives ideal relationships with nature as Master, Apathy or User.
- (ii) **Positive relationship with nature:** All of the students focused on positive characteristics of types such as protecting nature, mutualistic relationship with nature and having affection toward nature which matched with the types like Steward, Partner and Participant.
- (iii) **Technology regarded as differently:**
Although technology and its relationship with human-nature relationship was not the main focus of the present study, since they are included in the narratives in the HNR types, place of technology in nature and its usage by humans were also analyzed as an additional information for students' own ideas regarding the human-nature relationships.

Views of students related to how technology can be used within the human-nature relationship was identified as four category. These categories are (i) technology for welfare of nature, (ii) technology for limited welfare of nature, (iii) technology for both humans and nature, (iv) technology as harmful to nature. Most of the students perceived that the technology can be used for the welfare of nature. They generally emphasize that technological advancements can be used to enhance the nature and we can help for protection of nature with technology. While some of the students –which are generally Stewardship type students-views that technology can be used for the protection of nature and for its welfare; some of the students thinks that although technology can be beneficial for the nature, nature cannot be original and pristine as it is before. On the other hand, some of the students view that technology can be used when both humans and nature provide benefits from its applications. Lastly, some part of students are totally against and they think that technology harms nature.

- (iv) ***Students' view towards technology can differ in types:*** Views of students who places technology as an important and beneficial factor in the relationship between human and nature were generally supported the Stewardship type as their own ideal human-nature relationship. On the other hand, Partnership students generally support the idea that technology can be used when both humans and nature benefit from nature. Lastly, participant type students generally supports that technology can distort the nature and it is better not to use. In addition, if they have milder views, they support that that technology can be used for welfare for nature, but the world never become as its original state. Although these views about technology corresponds to types that is indicated like aforementioned, types of some students do not match with their views on technology usage as it is stated in the characteristics of that type. To illustrate, according to Fatih and Funda, who are the fifth grade

students, explicitly and completely against the usage of technology. They stated that technology should not be used in the nature because it will harm it and other animals do not adapt them to these technological implementations in the nature. However, instead of their views on nature is like Participant types; their selected types of HNR were analyzed as Partnership. Since the scope of the study is not solely on technology, the reason behind this situation might be discussed in further studies.

4.4 Middle School Students' Views on Other People's Images of Human-Nature Relationship

By taking into account that each human have different worldviews and have different relationship with nature (van den Born, 2008), additional to the students' own views on humans' 'appropriate' relationship with nature, researcher wanted from students to share their views regarding how other humans actually relate with the nature in today's world. For this reason, under this section, information related how middle school students view other people's relationship with nature were presented. The following research question guided the present study in the context of images of human-nature relationship by considering the students views on other people's HNR types.

Research question 1.3 What are the views of students related to images of relationship?

Research question 1.3.2. How do middle school students view relationship of other people have with nature?

Firstly, the findings interpreted from drawings and explanations of drawings were presented. Analyses of drawings were made under three sub-categories such as positive, negative, and differential relationships with the help of the aforementioned coding rubric.

Afterwards, with the help of the interview data, findings from card selection task were explained to provide further evidences. Parallel to different worldviews that people may have, generally, students chose more than one typology by indicating there cannot be overgeneralization for humans' relationship with nature because there are billions of people living on Earth. For this reason, types of HNR that students selected in the card selection task were presented in terms of (i) one HNR type, (ii) two HNR types and (iii) multiple HNR types, respectively.

4.4.1 One HNR Type: Humans as Master

In this part, students whose views toward other people's relationship with nature was associated with the one HNR type was presented. A total of three students were depicted the typology of humans as a single typology and identified the type of humans as Master.

There were two fifth grade students and one eighth grade student who drew and explained the humanity's relationship with nature as 'Master' type. These students mostly and intensely picturized their views on relationship of other people have with nature as they are mistreating and ruining the nature and using the nature for their own profit. These students viewed that other people's relationship with nature as Master and did not emphasize characteristics of any other HNR type. In the drawings, they visualized and explained the humans while polluting nature, destroying natural environments to build human-made structures, distorting life of animals and using the natural resources for their own profit and for earning money. It is very important to recall that since HNR is an umbrella construct contains worldviews, it can be an indication of human behaviors (Braitto et al., 2017). For this reason, when the students are reflecting their views on HNR types of other people, they addressed to the some human actions on nature that they observed.

Since the students' views on type of HNR is Master in this case, Figure 4-9. was given for recalling the card of Master type.



Figure 4-9 Card of Master Type

In the drawing (Figure 4-10) of one of the fifth grade students, Beren depicted a differential relationship. While she compares two different natural environment and describe an elapsed time by symbolizing it with hourglass, she also indicates a prediction between human and nature from the negative point of view. In her explanation, she mentioned that humanity destroy natural environment in time.

To show this, she drew an hourglass in which the trees and animals transforming to the buildings in it over time. She explained her drawing that humans are using the nature for their own profit by saying like in the followings:

"Nature is ruining, humans are building structures and factories for their own profit. (...) Here [upper part of hourglass], humans are cutting trees and emptying the place, and here [lower part of hourglass] they are constructing building instead of trees. (...) Besides, humans are hunting animals to use them for clothes and shoes. (...)" (Beren, 5th grade, Female)



Figure 4-10 Beren's Drawing

Apart from the evidence presented in Beren's drawing and explanations of it, further evidences were provided by the student in the interview. She views that in today's world, humans place themselves over the nature and thinks that humans are living as only they exist in nature. She supports that humans do not want natural environment and other living things around them, because she thinks that today's humans do not consider cities as a part of the nature.

"Researcher: You said before that we cannot say a city life resembles to the natural life. Why do you think like that?

Beren: Yes, I said, because human beings do not want all living things in the environments they live in, except other people. They built houses to live. They act like only they live in nature. They think that they do useful things for humankind just as only we were there. They never think of other animals or livings. I guess people donot want them to be in the environment and I think they donot know their benefits and welfare." (5th grade, Female)

From these quotations received from the interview of Beren, one can conclude that she views humans as Master over nature. Humans were explained as doing whatever they want to nature for their own benefit and live the life they want because they consider their own profit. She views other people acting as they are the only livings in nature.

Similar to Beren, a male fifth grade student Fatih wanted to show humanity's relationship in the course of time. He drew a negative and differential relationship between human and nature in his drawing (Figure 4-11). He compares both first and ten years later situation and stated the humanity's negative relationship with nature. To show that he splitted the page in half and drew the first situation and ten years later of nature.

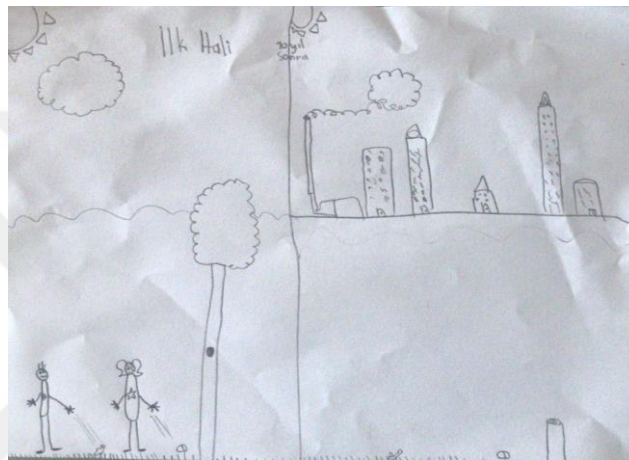


Figure 4-11 Fatih's Drawing

According to his explanations, on the left handside, two kids were throwing trash on the ground, while backwards there were mountains and trees. On the right handside, he explained that eventhough ten years were past, the trash thrown by kids were remaining, the trees were cut down and buildings and factories were constructed on the mountains. While he depicted the on-going effect of humans on nature with the remaining garbages, he also told that humans are mistreating the nature and using it for their own profit by explaining his views as in the following:

"Humans construct a tunnel, they flattened top of the mountain. On the mountains, they made buildings. As you see, after ten years later, there is a factory that releases gas, garbages remained on the ground. Trees were cut down." (Fatih, 5th grade, Male)

Additionally, while explaining the drawing, Fatih mentions how technological advancements affect the humanity's relationship with nature and nature itself. From his explanations, characteristics of Master typology can be identified:

"Humans are destroying nature, cutting down the trees and construct buildings instead of them. (...) In order to make production and earn money, they build more and more factories with the developing technologies. (...) As the technology enhances, more factories were built by humans for produce more. This goes like that on and on." (Fatih, 5th grade, Male)

As understood from the explanations of Fatih's drawings, he focuses on how humans take advantage from nature for their own benefit such as earning money and producing product in the factories.

While the evidence given above so far were from the drawings and explanations of these drawings, similar views related to human-nature relationship were mentioned by Fatih in the interview of card selection task. When the card of Master type was shown him, he strictly disagreed with the provided thought balloon by supporting the idea with his own words:

"It is not true that humans are over the nature. However, most of the humans act as if they are superior of other animals. They buy animals; restrict their freedom for their own enjoyment. They go for a walk with animal, although animal is tired, they forced to walk them as they want to." (Fatih, 5th grade, Male)

Fatih focused on the interview that humans act like they are superior of other animals and do whatever they want for their own enjoyment.

An eighth-grade male student named Arda stated that the humans are like Master typology, which always trying to destroy nature for their advantage. When he is asked to draw humanity's relationship with nature, he illustrated a basic drawing as in the Figure 4-12.

Arda explained his drawing by emphasizing that both human and tree he drew symbolizes wider concepts. From his point of view, while the human symbolizes the whole humanity, tree was drawn to refer the nature.



Figure 4-12 Arda's Drawing

From the interview data that explains what he drew, it has identified that Arda depicted negative relationship between the humans and nature. He shared his views like below:

"The relationship between man and nature like that: Nature helps us, humans harm it. Therefore, I think that is how the relationship works between humans and nature. (...) There is a tree in my drawing and a person who cuts the tree. Well, why did I draw something like this? Let me say it first. Well, because nothing else can come to the minds at these times, I cannot think of a peaceful person in my mind. There is a human model emerges in my mind that people who do everything for themselves." (Arda, 8th grade, Male)

From Arda's explanation, it can be understood that he views humans that benefit nature for their own profit and do anything they want for themselves. According to his view, there is human model in today's world that always harm nature and affect nature negatively.

4.4.2 Two HNR Types

In this part, students who selected two HNR types was presented. More than half of the students indicated their views on relationship other people have with nature by choosing two HNR types. While some of them select two negative types such as Master and Apathy; some of them selected one negative and one positive types for

humans as they view that there are two kinds of people who are treating the nature well and bad.

This part was organized whether students view humans' relationship with nature only negatively or both negatively and positively. In the first section, students who viewed the types of other people as Master and Apathy were presented. In the second section, students who depicted two different kinds of human types that are harmful and beneficial to nature were examined with different types.

4.4.2.1 Negative Relationship of Other People Have with Nature: Humans as Master and Apathy toward Nature

As stated earlier, some of the students were depicted more than one HNR type in their drawings. These students viewed the relationship of other people have with nature as both Master (Figure 4-9) and Apathy (Figure 4-13). Therefore, in their drawings and interviews, both the characteristics of the Master and Apathy types can be found.

There were four students drew and explained their views of humans' relationship with nature as both Master and Apathy. While they described the humans as mistreating to the nature and using it for their own profit, they also explained in their drawings and interviews how humans do not care and not think on the rights of other livings.



Figure 4-13 Card of Apathy

Although they do not clearly portray the apathy toward nature in the drawings very well, they tried to put some indications and symbols related to it. Students mostly stated the type of Apathy in their interviews from card selection task and from the explanations of drawings. In this way, with the help of both the drawings and interviews done along with the card selection task, in-depth data were obtained from the students.

One of the fifth grade students, Deniz, reflected the negative relationship of humans with nature. He described how humans mistreat to the nature and behave like they do not have impact on nature in his drawing like in Figure 4-14:



Figure 4-14 Deniz's Drawing

As seen from the drawing and according to the explanations of Deniz, a man come to cut down the tree without considering the possible consequences. As a result, tornado and lightning storms are appearing since humans distort the balance of nature. In that sense, Deniz focuses on the aspects that humans mistreat to the nature, use the nature for own profits and besides, he mentioned humans do not consider the possible consequences of their impacts on nature.

He gave the idea of apathy of humans toward nature by symbolizing the factory smokes, tornados and lightning storms, and explain the humans as Master by depicting the humans who cuts the trees for obtain mine. He explains the humanity's apathy relationship with nature in his drawing in a roundabout way as in follows:

"Humans cut down trees, distort the balance of nature. With the smokes releasing from factories, humans cause greenhouse effect and make the Earth warmer. Then, tornados and lightning storms appears. However, humans do not consider these situations. (...) Insensible factory owners do not care how much they release smoke to the air, although they are said to attach filters to the factory chimneys. They do not care, they cause greenhouse effect." (Deniz, 5th grade, Male)

In addition to the Apathy type he attained to the other people, in the interview of card selection task, his views toward humans' relationship with nature were also identified as 'Humans as Masters'. He explained how relationship of humans with nature is dominant over nature by providing examples like in the following:

Researcher: *How is the humanity's relationship with nature in your opinion Deniz?*

Deniz: *Humans do not know value of nature, they behave very bad.*

Researcher: *Why do you think so?*

Deniz: *Well, let me give you some examples. It is a recent event. Humans cut down thousands of trees in Kaz Mountains [mountain with oxygen-rich forests placed in cities of Çanakkale and Balıkesir in Turkey] just because of constructing mine. Besides, I guess it was in Istanbul [the most crowded, economic, historical and socio-culturally leading city in Turkey], people, God knows how many trees, will cut down for building houses and residences. They were waiting for approval as I heard."* (Deniz, 5th grade, Male)

As can be seen from the quotation given from the interview data of Deniz, he expressed relationship between humans and nature as Master type, since he emphasized the harm of nature by humans for their own profit and economical welfare such as building mine and building residences.

Additionally, Elif described the human's relationship with nature in her drawing by splitting the page in three parts. Nevertheless, there were three different examples related to how humans relate with the nature. It is not analyzed as the differential relationship, rather Elif's views toward humanity's relationship with nature was negative relationship. The drawing of Elif can be seen in Figure 4-15:

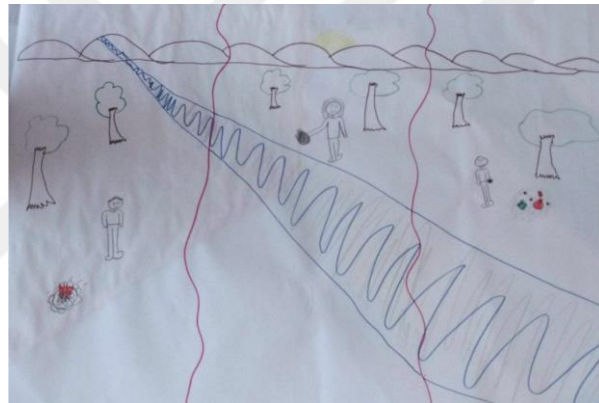


Figure 4-15 Elif's Drawing

In the drawing of Elif, people were mistreating the nature without caring. In the first part of the picture, Elif depicted that one man burning fire in the forest during picnic and leave the fire without putting it out. In the second example, someone throw garbage to the water, while in the third one, a man throwing garbage on the soil. Although Elif thinks that there were other people that is trying to protect nature, according to her, in general, humans harm the nature without considering and caring it.

While in the drawing of Elif, it is understood that humans are mostly viewed as Apathy toward the nature. From the interviews of card selection, Elif mentioned the Master characteristics of the people additional to the Apathy as in the following:

"Researcher: Which of the cards would you select to explain today's relationship of other people have with nature?

Elif: I would choose this one [by showing the Master card].

Researcher: Why?

Elif: Some of the humans uses the nature and natural resources in a bad way. They think that they can alter and replace these natural resources with the money and technology. They assume that technology and money can bring all of these natural resources back. They do not care the nature." (Elif, 5th grade, Female)

From this dialogue, it can be understood that Elif views the humans as Master over nature, as well as Apathy toward the nature.

Ecem, a fifth grade girl student, delineate two different environments and draw a differential relationship to explain relationship of humans with nature (Figure 4-16).



Figure 4-16 Ecem's Drawing

Ecem split the page in half to show a comparison of clean and polluted environment, and explained the reason why the first environment turned into like second environment. By doing so, she had a chance to explain how she views humans'

relationship with nature, with the help of the symbols drawn in the picture. To illustrate, while on the left handside, there is a clean nature that has natural assets like trees and flowers; on the right handside there were not any trees and flowers, instead there can be seen lots of garbages on the ground and near the trash bins.

Moreover, while Ecem explains her drawing with the interview questions, she gave clues related to both Master and Apathy types. She pointed out how humans benefited from nature for their own interest and profit and indicated the careless humans toward nature:

"Humans do not give the value that nature deserves. They cut down the trees for producing paper, selling it and earning money. They treat to nature badly. They pick up the flowers carelessly to give it to their mom. They throw their garbage on the ground. For example, they do no consider the birds and throw their gums to the ground. They do not think birds can eat and die because of gums. That's why I do not think that humans give the value that nature deserves." (Ecem, 5th grade, Female)

To add, as a consequence of pandemic on nature, Ecem give an example about humanity's apathy toward nature in the context of ongoing pandemic as in the following:

"Humans behave badly to nature. Even now, they throw their masks and gloves to the nature. They throw them to the sea and fishes eat these plastics, which is eventually come back to the dinner table of humans." (Ecem, 5th grade, Female)

Apart from the findings received from the drawings and interview data of drawings, data came from the interview of card selection task either.

Parallely, one of the eighth grade students, Emre views the types of humans as both Master and Apathy. Emre has a more specific perspective while depicting the relationship between the other people and nature. Although he selected cards and described that the humans have both the types of Master and Apathy, he drew a picture, which reflected consequences of the ongoing COVID-19 pandemic on our planet. Additionally, Emre depicted a differential relationship such as before and after pandemic period. The drawing of Emre can be seen in Figure 4-17:

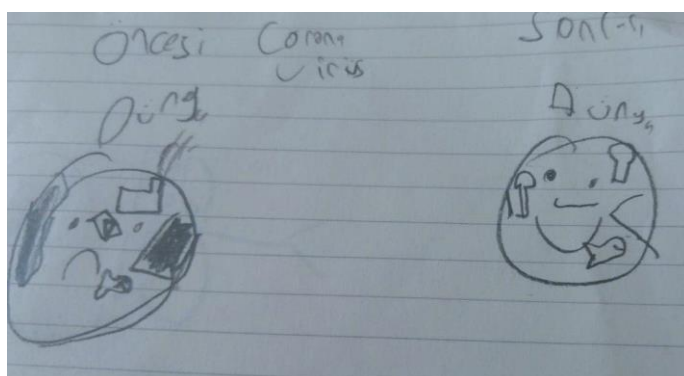


Figure 4-17 Emre's Drawing

Emre explained the humans' relationship with nature by emphasizing the pandemic context. He depicted the time dimension by drawing the Earth before COVID-19 and after COVID-19. According to Emre, Earth was polluted by the humans before COVID-19. However, after COVID-19 pandemic, the nature renewed itself due to the absence of humans. Emre explained his views like below:

"Before COVID-19 pandemic, humans do not care about the world. They spoil the waters with oil, pollute the soil, create air pollution. However, after the emergence of COVID-19, Earth was cleaned and renewed itself (...) because humans cannot go outside, they cannot throw garbages to the ground (...) and as the factories did not work, release of gases from the factory chimneys are stopped. (...) Humans do not use perfumes as they did not go outside and sit at home. That is why the ozone layer repaired itself and greenhouse effect decreased." (Emre, 8th grade, Male)

Although it is not directly mentioned that humans are Apathy and Master over nature, the impact of humans on the nature was described with the context of COVID-19. According to Emre, humans harm the nature with different kind of pollution, factories and personal hygiene products. Therefore, it was analyzed that he mostly emphasized the Apathy type as well as Master. He supported his ideas by choosing the Master type card in the card selection task and stated that humans are like the Master because they are trying to solve all the problems by using technology.

In conclusion, four students among all participants chose the types of 'Master' and 'Apathy' as the humanity's relationship with nature. To be clearer, 'Master over

nature’ has a big idea that “humans dominate nature, harm nature for their own profit”. While students define that humanity’s relationships are like the “Master” type, they indicated characteristics like below. They also provided examples to support their ideas, which was presented with the phrases in the Table 4-12.

- (i) Humans harm nature for their own profit, will and for earning money.
- (ii) Humans thinks that they have right to change the balance of nature.
- (iii) Humans thinks that they can solve all the problems with money and technology.
- (iv) Humans are superior to other livings.

With a slight difference from Master, students who think that people are generally act apathetically and view the types of humans’ relationship with nature as “Apathy towards Nature”, hold the big idea that “humans do not care the nature”. Accordingly, students who select Apathy type for other people used the sentences as in the following:

- (i) Humans do not care and value the nature.
- (ii) Humans thinks that they do not have impact on the nature.

It is important to emphasize that Master and Apathy types have a lot in common, when considering the statements of students. However, in order to ensure the consistency of analysis, researcher provided a difference between Master and Apathy types based on the narratives of HNR types adapted from the Braitto et al. (2017). In both of the typologies, there was an intense focus on the harmful effect of humans. Students who saw humanity as Master and Apathy generally mentioned that humans harm and destroy the nature. Yet, to achieve the identification between these two HNR types, it is important to catch differences between these two typologies. Explicit domination of humans over nature for their own profit and for earning money, explicit intention of destroying nature with technology and/or/ money was needed to be identified as the Master type.

On the other hand, for the Apathy typology, statements including explicit emphasis on lack of caring and valuing of nature, thinking that humans do not need nature to live and explicit indication of no impact on the nature were needed.

Phrases that taken out from interview data related to the Master and Apathy can be found in the Table 4-11 and Table 4-12 respectively for providing further evidence for students' selection of types regarding the relationship of other people have with nature.

Table 4-11 Phrases of Apathy toward Nature

Code	Phrases of Apathy toward Nature
Apathic to nature.	Not realize the beauty of nature
	Not care nature and nature becomes bad
	Not realize that nature is ruined
	Not care life of animals
	Not think that they have an impact on nature
	Not give value to nature

Lastly, most of the students included in their drawings or in their explanations that humans are cutting trees, are throwing garbages on the ground, are polluting the water, air and factories and cars releases poisonous gases. However, these students indicated the characteristics of both Master and Apathy as a reason of given example actions above.

Table 4-12 Phrases of Master over Nature

Code	Phrases of Master over Nature			
	Harming nature	Hunting animals	For own profit building houses	For own profit / for own sake
Dominating over nature	Create pollution		Cause extinction/decrease in biodiversity	Factory gases that pollute air
	Destroy/ruin natural places			Disturb animals
	Create agricultural lands by cutting trees		Cause greenhouse effect	Deforestation - cutting trees
	Harm marine animals		Cause acid rains	Exhaust smokes of cars
			Picking flowers	
	Dominate for earning money		Nature occupy more place	Act like only they live
	Power over animals		Dominate nature for trade	Do whatever they want
	Not want natural assets around them		Can use nature whatever they want	Only think themselves
	Think nature occupy place more			

4.4.2.2 Positive and Negative Relationship of Other People with Nature

Some of the students drew their pictures by considering both negative and positive relationship of humans with nature, rather than mentioning solely negative relationship. According to these students, while some of the humans protect nature, some of the humans harms the nature.

While Funda was selected types of humans regarding their relationship with nature as Master and Steward; Miray described as Master and Partner. Additionally, Mehmet viewed the HNR types of other people as Master and Participant. Lastly, Tunahan and Ezgi described the relationship of other people with nature as both Apathy and Steward.

First of all, data came from the drawing and the interviews of drawing and card selection task, it was found that one of the fifth grade students views HNR types of other people as both Master and Steward. Funda has supported the idea of two types of humans as Master and Steward. While she indicates both negative and positive relationship, she presented a differential relationship in the picture by splitting the page into half. While on the left hand side, there was a clean nature was described, on the right hand side there was a polluted nature was illustrated in Figure 4-18:



Figure 4-18 Funda's Drawing

With regards to the drawing, she states that:

"I drew a picture to illustrate how humans treat badly and nicely to the nature. Especially, I drew this difference to show, especially, how humans do not look after the nature and mistreat." (Funda, 5th grade, Female)

In the explanation of drawing, she states that if she could be able to draw people on the left hand side, she would draw a person who feeds birds, protect nature, irrigate trees and pick up trash. However, on the right hand side, she drew a car that releases smokes, trash bins and trash that give off its bad smell. Moreover, Funda explained her drawing by anthropomorphizing; suns and cloud are happy on the left, while they are sad on the right hand side because of the air pollution. She places two different perceptions of types for humans relationship with nature by mentioning:

"If I would draw humans, draw them while killing the animals, causing global warming by using perfume, and would like to show how polar bears and penguins are harmed. On the left hand side; however, I would draw humans while picking up trash, feeding animals, protecting nature." (Funda, 5th grade, Female)

As can be understood from the evidence of interview of drawing, she views the humans as both Master and Steward.

Apart from the drawing, card selection task supports her idea related to humans as Master. She stressed that animals provides humans benefits and humans help them; however, humans do this only for their own economical profit:

"(...) All humans do is help animals with feeding them. Yet, they do it for their own profit. They help to natural beings just because they take advantage of them like selling for money." (Funda, 5th grade)

From this explanation, we can interpret that apart from the Stewardship type; humans are also viewed as Master by Funda.

Tunahan, different from other participants, focused the negative relationship of humans with nature by perceiving the typology of Apathy toward nature, instead of Master. Although he depicted a positive relationship in his drawing and expressed characteristics of humans as Stewards of nature, while explaining the drawing and

expressing the choices in card selection task, he mentioned how humans are Apathy toward the nature.

In the drawing of Tunahan, there is a clean nature illustrated the type of Stewardship which is shown in Figure 4-19:



Figure 4-19 Tunahan's Drawing

As seen from the drawing, according to the analysis of drawing, it is identified that Tunahan views humans as Stewards who do not pollute nature, do not burning fires in the forest and picnic area, are always picking up their trashes, enjoy nature without harming it and protect nature. On the other hand, when he explains the drawing, he also mentioned that apart from the Steward of nature, there are humans who do not care and harm the nature in an opposite way. His views toward both negative and positive relationship of humans toward nature as in the following:

"Actually, while some of the humans do not harm the nature, the other part of the humans can be harmful for nature. (...) They make barbecue in the forest, and leave there without picking up her trash and put out the fire they burnt. Then, there occur forest fires. They leave their trashes. (...) On the other hand, some people never throw garbage on the ground; they do not start a fire and cause forest fires. They protect nature from harm." (Tunahan, 5th grade, Male)

From Tunahan's explanations, it is understood that he views humanity's relationship as double-edged with both negative and positive relationship.

To him, while some of the humans harm nature, others protect it. In order to clarify that the negative typology of Tunahan's views are Apathy toward nature, instead of Master, further evidences were presented in the following to show how Tunahan depicted the characteristics of Apathy in the interview of card selection task.

"Humans cause animals to extinct in the nature, because the icebergs are melting due to the global warming. Humans also cause global warming because of their cars' exhaust gases and gases coming out from the factories. Nevertheless, they do not know what they do and how it affects nature while they are driving their cars." (Tunahan, 5th grade, Male)

Since Tunahan explicitly indicated that humans do not know how their actions impact on nature, his views can be analyzed as the typology of Apathy for the human-nature relationship. To conclude, Tunahan is one of the students who perceives humans as both negatively and positively related with nature and selected two opposed typology such as Apathy and Stewardship for the typologies of humans.

Similar to Tunahan, Ezgi, who is an eighth grade, female student views the negative relationship of humans with focusing on the Apathy typology, while states that there are other humans who have positive relationship with nature with the typology of Stewardship. In Ezgi's drawing (Figure 4-20), both types of humans and their actions can be seen.



Figure 4-20 Ezgi's Drawing

In her drawing, Ezgi mentions that some of the humans do not care nature and pollute nature, while other humans make an effort to protect nature by warning the people. She explains the views toward humans' relationship with nature by mentioning the characteristics of Apathy typology as in follows:

"Humans pollute the nature by throwing garbage on the ground, and that is why the flowers were withered here [shows the flowers that is withered]. The apples on the trees were also sad. I also drew air pollution by indicating it with grey colour on the clouds and sun. I could not draw but these smokes were coming from the chimneys of factories. (...) Unconcerned owners of factories did not attach filters on the factory chimneys. They do not know how they harm nature. (...) Besides, some of these owners do not do recycle of the wastes coming out of factory even they should do it. As a result, plastic wastes do not disappear over years and they harm nature." (Ezgi, 8th grade, Female)

As analyzed from these interview data of drawing, Ezgi views that humans harm nature without considering its consequences and some of them does not even know their impact on nature. Since these explanations were matched with the characteristics of Apathy, her views towards humanity's relationship with nature were identified as Apathy towards nature.

On the other hand, as Ezgi views that there are humans who have positive relationship with nature, she also expresses humans who are trying to protect nature by mentioning:

"Although some of the humans harm nature and do not care, there are still people who want to protect nature like the girl in my drawing [shows the girl screaming as 'What have they done here?']. They wanted to protect nature for our future, because destroying nature means destroying our future." (Ezgi, 8th grade, Female)

As a supportive evidence to the analysis came from the drawings and its explanations, from the interview data of card selection task it is identified that Ezgi use statements that support she views humans as both Apathy and Steward. She indicated that the picture shown in the card of Apathy typology depicted the present situation of the humans and the nature.

Moreover, Miray viewed the typologies of humans as both Master and Partnership. In her drawing (Figure 4-21), she focused on how humans help to nature and how

nature helps humans. Therefore, it is understood from the drawing that Miray views that some part of the human beings have Partnership typology.



Figure 4-21 Miray's Drawing

Although it is not clearly reflected in her drawing, she explains how the humans have characteristics of Partnership:

"Humans are both treat nature bad and good. I drew the better case. In my drawing, there were humans who are picking up trashes on the ground and throw into the bins. I could not able to draw but, there is a sea with trashes on it (...) people will picking up these trashes from the sea. (...) What I am saying is that humans and nature benefit each other. Humans help nature by picking up trashes, nature benefit humans by providing them oxygen. As a resuly, humans I drew go outside for fresh air." (Miray, 8th grade, Female)

From the explanation of drawing, researcher interpreted with the help of the coding rubric that Miray views humanity's relationship with nature as Partner. In addition to the Partnership; yet, from the card selection task, it is found that she also views some of the humans as Master. As stated in the drawing explanation, as a human type who treats badly to nature, she mentions chaacteristics of Master by saying the followings:

"To me, today's humans are think like this card [showing the Master card], because humans always think that they can buy anything with money

including nature. (...) In my opinion, nature and humans are equal: however, some of the humans value themselves more than nature, in a sense they see superior themselves over nature." (Miray, 8th grade, Female)

To sum up, Miray views humans both in a negative and positive relationship with nature and selected the typologies of humans as Master and Partnership.

Similarly, Mehmet also depicted both positive and negative relationship of humans with nature.



Figure 4-22 Mehmet's Drawing

While in his drawing (Figure 4-22) mostly, there can be seen symbols indicating Participant typology, his interview data gave evidences that humans have both negative and positive relationships with nature, and some of the humans also show the characteristics of Master in addition to the Participants. In his drawing, he illustrated a positive relationship of humans with nature by presenting a clean natural environment and a person who enjoys nature:

While Mehmet explained his drawing, he told what he drew. According to him, there is different types of humans, where some of the people treat well to the nature, some of them can harm the nature. Although he wanted to draw two different scenes for these different types of human relationship, he indicated that he drew only the

positive relationship occurring between the humans and nature and explained his drawing as in the following:

"(...) In this drawing, there are flowers, a river is running and a person sitting under the tree, there is a bird nest above him. He is resting and watching the view, because he is also part of nature. (...) I guess, humans are part of nature, for some of the people of course. (...) Because there are other humans who want to harm the nature for earning money." (Mehmet, 8th grade, Male)

As understood by the Mehmet's explanations, he depicted people who feel themselves as part of nature in his drawings, and additionally, he expressed that humans can be also Masters over the nature because they harm nature for their own profit and for earning money. Additionally, Mehmet describes the humans with Master typology in the interview of card selection task as below by focusing on the technology usage of humans:

"When said technology, factories come to minds. For make the factories work they need electricity, and for electricity they occupy places from the natural environment, harm the natural places. To illustrate, they construct dams on the water resources and hydroelectric power plants to produce electricity. That causes other livings to die and disappear." (Mehmet, 8th grade, Male)

From this expression of Mehmet, it is clearly seen that humans are Master over nature because they harm nature for own profit and not considering nature and other livings while constructing human-made technological power plants. In brief, Mehmet views that humans have different typologies as who are treating nature good and bad. He mentions that humans are both Participant of nature and Master over nature.

4.4.3 Multiple HNR Types

In this part, views of the student who select the typologies more than two for the humankind's relationship with nature were presented. Only one student chose typologies that represents both negative and positive relationship with the nature by emphasizing three different typologies.

Gamze, who is a female, eighth-grade student, selected typologies for humans' relationship with nature as Master, Apathy and Participant and illustrated a drawing (Figure 4-23) that includes these typologies of humans and she provided several examples of humans' relationship with nature.

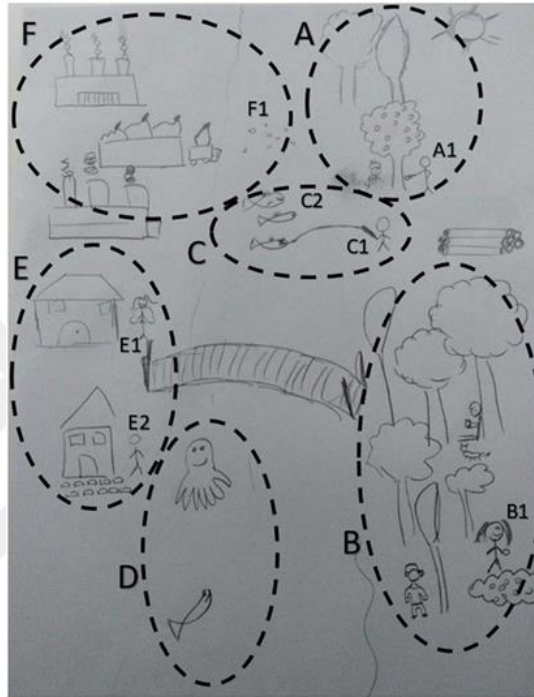


Figure 4-23 Gamze's Drawing

As can be seen from the drawing, there are several components. To clarify the components and the views of Gamze while drawing it, her expressions towards the drawing can be found below:

"In this drawing, I tried to describe the discrimination of world of humans and world of natural environment. (...) For this, I drew a bridge and tried to show how humans are enthusiastic to live in nature but they actually are destroying it. (...) In my opinion, people should not be generalized, because there are both conscious people and unconscious people. It is wrong to categorize humanity with only one typology." (Gamze, 8th grade, Female)

With this explanation, it is analyzed that Gamze views a differential relationship of human beings with nature, because she provides negative relationship of humans with nature generally on the upper side of picture, while gives more positive relationship on the downside of her drawing. According to her, there are different kinds of people who are conscious and unconscious towards nature and people should not be generalized with considering only one typology. Supporting this view of her, Gamze drew several components to show different typologies of humans' relationship with nature by emphasizing Master, Apathy and Participant typologies. She explains in the interview her drawing as in the following:

"Upper side of the drawing, there are humans that trying to benefit from nature for their own profit by cutting trees and humans who are enjoying nature by sitting under the tree. This person (see the person A1 on the picture) want to cut all of the trees that is actually beneficial for him in real life with providing oxygen. He cuts trees for earning money and they spent the same money for seeing green holiday places, which is ironic (see part A on the picture)." (Gamze, 8th grade, Female)

The explanation of Gamze given above proves that she views humans as both Participants who can be part of nature with enjoying it and not harming and as Master who are destroying and cutting trees for earning money. As an additional proof why Gamze's view toward humanity's relationship with nature was analyzed as both Master and Apathy typology, another evidence from the interview of drawing were provided below:

"Again, on the upper side of the picture, there are factories constructed by humans and which are using the nature as a trash bin (see part F on the picture). (...) Humans constructed factories over here that are both poisoning the air with releasing gases and polluting the water resources nearby, with their wastes. That is why sea is dirty (see part F & F1 on the picture), and there are lack of fishes in the sea (see part C2 on the picture). Despite this situation [the lacking fish in the sea], here a person is still fishing without caring how the fishes are sparse in the sea and they do not allow fishes to reproduce. (...) This person hunting fishes, although there are sparse amount of fish, because he considers these fish as money (see part C on the picture). He could not see how these fishes swim beautifully (see the person C1 on the picture). (...) Similarly, I drew here an octopus and a fish to show that normally, there should be biodiversity in the seas such as colorful fishes and corals; however, in here there is just an octopus and fish remained because

humans are polluted the carelessly. (see part D on the picture)." (Gamze, 8th grade, Female)

When analyzing the explanation provided above, researcher identified a different typology additional to the Master and Participant, which is that the typology of Apathy toward nature. As seen from the interview data, Gamze emphasized that humans are Master over nature because they are using and harming the nature for earning money. Besides, dominantly, it is identified that humans are also Apathy towards nature because they keep fishing without considering the biodiversity and how other livings are right to live and they are polluting the water resources laxly with the wastes that produced from factories. From these, it is concluded that humans are viewed as Apathy, as well as Master and Participant by the Gamze. For an additional evidence how Gamze views humans as Participants, explanation of her should be examined:

"Downside, there are humans who are enjoying nature without harm it. (...) These kids are being part of nature. Especially, this girl (see the person B1 on the picture) is being part of nature most efficiently because she realizes what happens around her, listens the sound of nature and smells it (see part B on the picture)." (Gamze, 8th grade, Female)

With this explanation, it is identified that Gamze views some humans as part of nature that know how to enjoy from nature and feel it physically. Lastly, Gamze expresses that some of the humans are unconscious eventhough they love nature and live nearby the natural places, they could give harm to nature without realizing it.

"There is another woman (see the person E1 on the picture) who seems to like living in nature and wanting to live near nature; however, she wears clothes such as fur made out of foxes and snakes who are part of nature. Besides, there is another man who want to connect with nature but with pouring concrete in front of his door he could not feel the nature (see part E, and the person E2 on the picture)." (Gamze, 8th grade, Female)

Apart from the drawing and the interview data of drawing, Gamze selected the cards that shows Master, Apathy and Participant in the card selection task, which shows the analysis and findings of the study more trustworthy.

To summarize, Gamze views the humanity's relationship with nature by considering three different typologies such as Master, Apathy and Participant. Additionally, she provided an unnamed category by giving examples related to the unconscious people.

4.4.4 Human-Nature Relationship as 'Boomerang'

Some of the students expressed that all other people actually punish themselves by harming nature. According to these students, not protecting nature can turn them like a boomerang. In other words, they view that harm made by humans boomerangs back and affect humans in different ways. The explanations of the students regarding how nature reply to the humans who harm itself were provided under this section.

Deniz, a fifth grade student, explicitly and intensely mention that nature can reply to the humans when humans harm or distort the balance of the nature. First, he explains what he drew by pointing out how nature is responding to the impacts of humans as in the following:

"[He is showing and explaining what he drew] In my drawing, there is a man who is coming to cut the trees, then there is a factory that releases poisonous gases to our atmosphere. Eventually, there emerges tornados and lightning storms happened. I mean, nature responds humans like that: 'Are you treating me like this? Okey, then you will pay the penalty of your behaviours towards me. (...) To me, actually, people punish themselves by acting like that towards the nature. Nature does not do anything, it is just trying to protect its balance, for example, with the extreme weather conditions. However, eventually humans are punished. (...) How can I explain? Like when you throw a boomerang, and it turns back at to you, right? This is the situation in here. For example, humans throw the boomerang, the poisonous gases, to the atmosphere; and it turns back to you as storms." [Deniz, 5th grade, Male]

As can be seen from the interview of Deniz, he is explicitly how nature responding to humans and how humans are affected by their own impacts to the nature eventually, because nature is trying to protect of its own balance.

Similar to Deniz, Ecem provides another example from real life to show how humans are affected from their own impacts on nature.

"In my opinion, when we harm nature, nature responds by harming humans. However, people do this to themselves. For example, humankind release the wastes to the seas, then fish eat these wastes, at last we bring these fishes to our dinner table. We eat the fish we are poisoned. In a word, the damage we give to nature is actually returning to ourselves."[Ecem, 5th grade, Female]

Apart from what Deniz and Ecem said, Beren, Tunahan, Elif and Funda were also emphasized that if humans harm nature, they might be also harmed from the nature themselves.

"If nature is destroyed, humans will be also harmed by its consequences."[Beren, 5th grade, Female]

"If we do not harm nature, nature do not harm us."[Tunahan, 5th grade, Male]

"If nature is destroyed, we will be destroyed too."[Elif, 5th grade, Female]

One of the fifth grade students approached the boomerang effect by giving the specific example considering the pandemic.

"As people say, if someone hurts, do evil, it turns back to him. It is the same. I think we harmed nature, it turn back to us with the coronavirus"[Funda, 5th grade, Female]

Eighth grade students also supported the idea that nature responds to the humans who damage itself. Eventually, humans are affected by their own harmful impacts toward nature. Examples of Ezgi, Miray and Gamze can be found in the following that is received from their analyses of interviews.

"Polluting nature means destroying our future. By harming and mistreating the nature, humans are blown up by their own bomb. (...) If we treat badly to the nature, nature respond by taking revenge. Actually, implicitly we did it to ourselves. You can consider it like 'tit for tat'"[Ezgi, 8th grade, Female]

Miray, similarly, indicated her perceptions as in the following:

"It should be given importance to the nature, because if nature do not exist air become polluted, it affect our health and impact humans in a bad way. If we do not take the responsibility and not behave in a good manner, our impacts will turn around and damage us."[Miray, 8th grade, Female]

As a last example, eventhough there were many of another examples similar to these provided ones, perceptions of Gamze was presented below:

"Humans are destroying nature which can be very beneficial to themselves. Then, the consequences of their actions return them and hurt them. Nature responds them. (...) Humans actually are damaging their own homes, the nature. They do not know they will be affected from this in the future in a bad way." [Gamze, 8th grade, Female]

In summary, from the analyses of interviews, it was identified that nine students viewed that nature responds to the actions of humans to establish its balance, as a result humans meet with the consequences of their mistreatments to nature.

4.4.5 Summary of the Views of Students regarding Humanity's Relationship with Nature

In this part, the summary of analyses regarding how students view humanity's relationship with nature were presented. Since students mentioned different kind of typologies, to summarize and clarify the important points, Table 4-13. was provided below, that shows selection of typologies of all the students for human's relationship with nature.

According to the analysis made, the researcher has reached three main conclusions about this part of the study.

- (i) Multiple HNR types:** The students from both grades provide more than one type of human-nature relationship by indicating that humans are different from each other. Especially, some of the students explicitly expressed that humans can be divided into two categories as 'humans who treated nature bad' and 'humans who treated nature nice and good'. In line with this situation, the students explained their views towards humanity's relationship with nature as more than one typology.
- (ii) Humans mostly harm nature:** Generally, in the scope of the study, although there is more than one type of human, the participants of the

study view that most of the people treat nature very bad and not care the nature. In other words, when they compared the humans as bad and good, they mostly stated that most of the humans are treating nature in a bad way because of their own profit or because they do not care.

(iii) ***Humans as Master:*** Except from two students, other participants categorized humans as Master. They used phrases that supports the characteristics of the Master typology, selected the Master typology card in the card selection task. It is important to indicate that most of the students selected other types in addition to the Master type.

(iv) ***Nature responds as 'Boomerang':*** The students emphasized on how nature responds to humans when humans harm it and not protect it. In other words, students provide a feedback loop while sharing their views on how relationship of other people have with nature. In this part, both aspect of Partnership from contradictory point of view was presented and was provided what happens if humans' type will be the Master, Apathy and anti-Stewardship.

Table 4-13 Summary of the Views of Students Regarding Humanity's Relationship with Nature

Typologies Nickname	Master	Steward	Participant	Partner	User	NDG	Apathy
Beren	X						
Elif	X						X
Tunahan		X					X
Deniz	X						X
Fatih	X						
Ecem	X						X
Funda	X	X					
Arda	X						
Mehmet	X		X				
Emre	X						X
Gamze	X		X				X
Miray	X			X			
Ezgi		X					X

CHAPTER 5

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

The aim of this study was to investigate visions of nature of middle school students under three main components which are (i) images of nature that help to examine students' views on nature, (ii) values of nature to examine whether nature is important for students or not, and why it is important or not, (iii) images of human-nature relationship to examine 'HNR types' of the students. The findings were discussed under these components and their interrelations between each other in the light of the previous studies in the literature. Later on, effects of national curriculum on the students' visions of nature was discussed. Lastly, educational implications and suggestions for future research were indicated in this chapter.

5.1 Middle School Students' Images of Nature

In this study, middle school students were asked to imagine themselves in nature doing something with the help of the guided-imagery technique. It was found that students mostly visualize the natural setting of their imaginary in outdoor places such as forests, greenery, village, and lakeside. To add, most of them expressed that nature is a distant place, which is away from the city center, where there are not too many people, and does not include human-made constructs. These findings of the present study related to how students view the nature as a setting are consistent with the studies in the literature (Kalvaitis & Monhardt, 2012; Bonnett & Williams, 1998; Shepardson, 2005; Pointon, 2014). Parallell with the findings emerged from the studies of Kalvaitis and Monhardt (2012), Bonnett and Williams (1998) and Shepardson (2005), students in this study associated the nature with trees. Students imagined the natural setting as forest full of trees, with the colour of green. In other words, the participants of this study used tree as the symbol of nature like the

elementary school students of the Kalvaitis and Monhardt (2012) did. Viewing nature as green place, full of trees, flowers and animals might be due to the several reasons. Firstly, views of nature are developing during early childhood while they are heavily engaged with the outdoor play and these developed perceptions during early childhood become resistant to change (Keliher, 1997). Supportively, when asked students their past experiences in nature, they shared their memories from childhood ages when they are in their grandparents' village, when they are going to picnic in woodlands. For this reason, students in the study might match the nature with trees, forest and green places from their past childhood experiences. Secondly, according to Anderson and Moss (1993), images of nature in the children's literature and media sources might direct them to think nature in a stereotypical way by showing nature as vast green areas, forests full of trees. Thirdly, worldwide, the textbooks and formal education program provided in the schools might affect the students' way of perceiving nature, their environmental attitudes and knowledge (Korfiatis et al., 2004). Additionally, the visuals included in the science textbooks might have importance on enabling students to associate correct message of abstract concepts and text provided (Inaltekin & Goksu, 2019). By considering these, students of the present study might associate the pictures in textbooks and curriculum taught in schools with the nature concept. Besides, students might be affected from the visuals provided in the textbooks while sharing their own views of nature by saying greenery and forests.

As indicated earlier, in the present study, students imagined the natural setting where is away from the city life and nearly half of the students (seven students) imagined themselves alone, without the presence of other people. This finding of the present study is close to the result of the Pointon (2014), Rios and Menezes (2017), Flowers et al. (2015) such that the students mostly emphasized being nature refer to being away from the crowd of faces. This result might arise due to the lack of interaction of students with the nature. Since today's children cannot be intertwined with the nature enough (Louv, 2018), they do not perceive people as a part of nature (Pointon, 2014), and in turn they cannot be able to imagine humans in the natural setting–

except from themselves as they are instructed to visualize themselves in nature doing something. Lastly, understanding of what nature is can have an impact on views of participants about human existence in nature. Since nature generally referred as 'wilderness' as un-cultivated area (Macnaghten, 1993), the participants might not be able to match the wildlife images with their current lifestyles and cannot place the humans in their nature imaginery frequently.

On the other hand, in the present study, the other half of the students (six students) were imagined other people who are their families or friends from school in their images of nature. This might be due to their conceptions of natural setting, because students who depicted other humans (i.e. family members, friends, people who they do not know) in their visualizations generally mentioned natural settings as familiar places like woods, picnic areas close to city and home gardens. In a word, when their visualizations of natural setting are closer to the city center, the more they mentioned people in the nature imaginary. To add, it might be due to the fact that young age children experience nature generally with their parents or classmates.

Furthermore, according to data collected from the present study, the students imagined themselves surrounded by forests and greenery fields when they were asked to picture themselves out in nature. Besides, the study reveals students having little capability of imagining engaging with broader variety of animals during activities conducted in nature. What is more, students generally hope to be far away from the noise, crowd and human-made places. All these findings might be due to the fact that the students of present study dwell in the shoreless city center, where the wildlife and vast green spaces are limited, biodiversity is less than natural places. Therefore, the lack of variety in the images of nature of the students might be due to their limited interaction with nature in the cities. Supportively, it is indicated how far children away from the nature, they know less about the diversity of natural components (Sanaddon et al., 2008; Miller, 2007). In addition, since students are living in the city centers where the noise pollution, a large crowd of faces and human-made materials existed, they might be imagined themselves far away from this set up.

Moreover, while analyzing the students' images of nature, living things that were imagined by the students in the nature was also examined. In the study findings, the most frequently emphasized living things were the animals, and following this, the plants. The finding of the present study corresponds with the findings from previous studies (Flowers et al., 2015; Pointon, 2014; Rios & Menezes, 2017). In these previous studies, images of nature were depicted mostly with the biotic co-actors, which are animals and plants. Specifically, in this study, the component 'animals' attract attention more and spring to the minds more than plants and humans, when it is said nature like found in the previous researches (Kalvaitis & Monhardt, 2012; Bonnett & Williams, 1998; Litlledyke, 2004; Kellert, 1985). According to the result of these studies, it is addressed that animals composed of significant part of the nature views of the students. It is attention-grabbing that although students generally symbolize nature with trees and green areas, when they are asked to indicate natural elements they mostly mentioned on the 'animals'. This result might be arisen due to the misleading conclusions of anthropocentric view that placing animals superior to the plant kingdom (Bowker, 2007). Placing animal species over the plants might be the similarities between animals and vertebrate animals perceived by students due to the characteristics like ability to move, analogous body features, and ability to feel and perceive (Kahn & Kellert, 2002). For this reason, the students might depict animals more than plants because they feel close to their characteristics. Additionally, since animals are highly responsive than plants and creates much more opportunity for direct interaction with nature (Myers & Saunders, 2002), the students might tend to indicate mostly animals in their images of nature.

When considering the role of the species, findings revealed that students depicted a positive relationship with the species in the nature and none of them expressed any negative roles of living things in their images of nature. Similar to the results of Kalvaitis and Monhardt (2012), roles of animals were depicted with the words such as playing and being friends with animals, loving animals. The reason might root in the children's social development process. According to Myers and Saunders (2002), with the increase in capability of social interaction, children consider animals as

‘social others’ to interact, experience the world with and form relationships with them. Therefore, students might see the animals as social others to play with and be friends. Additionally, loving and caring for animals might be related to the biophilia hypothesis (Myers & Saunders, 2002), which humans innately predisposed to have affection toward nature (Kahn & Kellert, 2002).

Activities done and materials used in the nature were also examined when views of students were analyzed. In accordance with the previous studies (Kalvaitis & Monhardt, 2012), most of the students imagined themselves in nature while doing non-consumptive activities such as spending time with animals, observing nature and trekking/walking in the forest. In the study of Kalvaitis and Monhardt (2012), students depicted themselves mostly while playing in nature as a non-consumptive activity (Duffus & Dearden, 1990). On the other hand, although students depicted themselves in nature doing non-consumptive activities and imagined the natural setting away from the human-made constructs, some of the students visualized human-made materials such as park benches, roads, and bridges while they are expressing activities. Only one of the students mentioned natural materials as their tools for non-consumptive activities. This might be because of where students live (Pointon, 2014). As all of the participants are living in the city center, they might not be interact with the natural materials so often because of lack of interaction between them and nature. According to the report of WWF (2021), with the population rise, increase in demanding for foods, growing demand for raw materials, has increased the need for urbanization and in turn for meeting these demands deforestation and destruction of natural areas increased. Therefore, since there was a little greenery area left due to the urbanization and increase in deforestation in city centers than the rural areas, even if children want to interact with nature, they do not have any green places to go, play outside with the natural materials. On the top of it, families become more aware of the dangers of outside world and sometimes prefer them to stay at home with being protectionist due to the increasing urbanization and industrialization, decrease in parks and natural areas for enabling children to play

outside (Louv, 2018). As a result, sometimes families might make their children detached from the nature (Louv, 2018).

When examined how students expressed their feelings when they imagined themselves in nature doing something, it was found that students overwhelmingly stated and associated emotions with positive words such as feeling peacefully, relaxing and happy in nature. In the results of the present study, only three students depicted a negative feeling, which is 'scared from bugs, insects, and birds' in addition to their positive feelings towards nature. Students generally pointed out their affections and positive emotions toward nature as in the previous studies (Adams & Savahl, 2015, 2017; Änggård, 2010; Bonnett & Williams, 1998; Kalvaitis & Monhardt, 2012; Rios & Menezes, 2017; Stokas et al., 2017). The overwhelming positive feelings toward nature might stem from biophilia hypothesis put forward by Kellert & Wilson (1993) which supports the idea that humans have biologically and genetically predisposed to have an affiliation towards nature. This might be the why students depicted positive feelings toward nature (Kals et al., 1999), even if they have a little interaction in their city life.

In the literature, it is stressed that the younger children include more family members, friends and animals in their conceptions of nature than older age children (Kalvaitis & Monhardt, 2012). In this study, supportively, students who imagined other human beings in the nature images were generally from the fifth grade students. The reason behind might be that they spent their leisure time with their parents or friends more when compared with older age groups. On the other hand, there is a non-negligible amount of students who did not state any human-being in their nature images. The reason behind it might be that students are spending time on their own more in front of their technological tools. On the other, students might be affected by feeling apart from their friends because of distance education, and hence prevent to visualize other humans in their imaginery (Singh et al., 2020).

Since the students depicted mostly abiotic and biotic factors while imagining the nature, it can be said that the scientific view of students toward nature was

predominant similar to study of Pointon (2014). To illustrate, while students stated the existence of plants in nature, they also pointed out the 'photosynthesis'. When considering this conclusion from the perspective of aims of Education for Sustainable Development (ESD), it might be questioned whether educational programs only emphasized the concepts related to nature from the scientific aspect and whether schools do not put enough emphasis on other aspects such as aesthetic, ethical, economical and political dimensions (Pointon, 2014). Since the nature, society, policy and economy are mutually dependent (Fien & Tilbury, 2002), in order to make students answer the question such as what nature is in many perspectives, and make them think the sustainable lifestyle, other perspectives can be also inserted into the curriculums.

5.2 Middle School Students' Values of Nature

In the literature review, instrumental and intrinsic values were examined several times as a dimension of HNR (van den Born, 2008; Flint et al., 2013). In general, all the students in this study considered nature as important. According to the findings, it was found that overwhelming part of students value nature instrumentally by especially focusing on how humans survive thanks to nature. Only two students expressed the value of nature as intrinsically. Students who value nature intrinsically share the same characteristics that both predominantly mentioned their memories spent in their grandparents' village, then other students'. Both of them drive forward the aspect of other non-human livings' importance not because of their functions for humanity, but feeling affection to nature, when compared with other students who value nature instrumentally. These two students, who valued nature intrinsically, both have seen generally the best in humans by stating how people being nice to nature and protect it without their own profit. Both students looked optimistically while providing their views on how and why nature is important for them.

From other respect, similar to findings of the study, previous research of van den Born (2008) indicated that people generally mentioned the instrumental value by

indicating the nature as for tranquility, human health and life source. The reason why most of the students did not express the intrinsic value of the nature might be due to the fact that intrinsic value is regarded as an abstract notion and difficult to comprehend (van den Born, 2008). While students mentioned the instrumental value of nature, major part of them mentioned how nature is a source of them, provide foods and oxygen. The reason might be due to the fact that students live in the city center and they become alienated from the nature and instead of creating bonds, they perceive it as the resource of their needs.

Moreover, Sjöblom and Wolff (2017) presented their findings by emphasizing different kinds of values of nature. One of them is stated as material value which is also in line with the Kellert's (2002) utilitarian value, where humans are dependent on nature for survival and value nature for its functions. Similar with the value named as material and utilitarian value, in the present study, the students viewed nature as a resource of materials. In a sense, since sustainable development is defined in Brundtland report from an anthropocentric perspective and nature might be seen generally as a resource and exploited for human usage by the students (Bonnett, 2007, p. 710), as well as the definition of sustainable development in Turkish Science Textbooks of eighth graders (MoNE, 2018a). Learning from the definitions of sustainable development, children might think of nature from a more utilitarian perspective where its value is attributed for its functions of humankind. On the contrary, it might be better to direct students to think like the definition of sustainable life as indicated report in the IUCN, UNEP, WWF, 1991. It is indicated that living in harmony with nature provide more sustainable world and once people shared some rules to obey protect themselves and nature, they can live sustainably (IUCN, UNEP, WWF, 1991). In this way, children might appreciate the value of nature more intrinsically.

In his study which is related to children's moral conception and values for environment and environmental problems, Kahn (2002) found that children values nature as from two distinct perspectives named as anthropocentric and biocentric. According to Kahn (2002), children's reasonings were generally anthropocentric and

he proposes that the biocentric point of view improve by aging and having experiences. Although he approaches from different perspective compared to the present study, it has similarities with the findings of current study that the students generally have the instrumental value toward nature, can be also named as anthropocentric. This result might be due to the fact that students in the current study might not have enough experiences in nature due to their lifestyles in everchanging world.

5.3 Middle School Students' Images of Human-Nature Relationship

The present study showed that middle school students have different views on the images of relationship both when they express their own ideas on ideal relationship between human-nature and when they indicate other people's HNR types. Firstly, students' own idea regarding appropriate image of relationship; secondly, students' ideas on how they view other people's relationship have with nature were discussed.

5.3.1 Middle School Students' Own Images of Human-Nature Relationship

The results of the present study indicated that middle school students had one of the Steward, Participant, Partner and Nature Distant Guardian types reflecting their ideas regarding ideal relationship people have with nature. It could be inferred that there is a common link between these four types in that they demonstrate favorable relationship with nature even their underlying reasons and point of views may vary from each other.

In this study, the students generally pruned to select Steward and Partner among these four types. The reason behind this might arise from the fact that they grow up in a collectivist culture, which supports the adherence to group norms, their own traditions compared to individualistic cultures (Cukur, De Guzman, & Carlo, 2004). Specifically, Li and Ernst (2015) asserted that worldviews toward human-nature

relationship of collectivist cultures show greater emphasis on fragility of nature, protection of nature and impacts and responsibility of human society towards nature.

Although the focus point is not religious beliefs of the students, one reason related to students' selection of Steward type might be explained due to the Islamic culture in which most of the Turkish people define themselves as being Muslims (Cetin, 2019) with 99% according to the Turkish Government (European Commission, 2020). In the Islamic cultures, stewards or khalifas play an important role in explaining the relationship between nature and humans (Bujis et al., 2009; Kloek et al., 2017). Besides, the humans' responsibility to protect nature and feel respect is the main focus in Islam (Bujis et al., 2009; Kloek et al., 2017). Like stated in the narrative of Stewardship type, in the Koran, responsibility of protecting nature entrusted to the humans by the God (Bordeu, 2004). Taking into consideration these, participants', who are living in a Muslim country, point of view might be affected from the aspects of Islam with or without noticing (Kloek et al., 2017). However, it is important to reacquaint that religions of students did not asked, it is assumed that they are Muslims by considering the rate of religion distribution provided by Turkish Government.

Additionally, in the study of Li and Ernst (2015), it is addressed that when compared to industrialized countries, non-industrialized countries feel close to the types of Steward and User at the same time. In other words, when they are supporting the idea of protecting nature, they also mention for using nature to meet their needs. In the present study, although emphasis on User type is lesser than Steward and therefore, none of the students were categorized as User, both mentioning on the ideas 'responsibility to protect nature' and 'meeting needs from nature without excessive usage' can be seen. This result might be due to the fact that the students are raised in Turkey which is seen as non-industrialized, developing country.

Moreover, while students indicated the appropriate relationship between the humans and nature, they generally emphasized some actions such as attaching filters to the factory chimneys for preventing poisonous gas release, planting trees, usage of

renewable energy resources, not throwing garbages on the ground, raising the awareness of people related to the human-nature relationship, decreasing plastic waste. Participants might express these statements by leaning on their knowledge learned from school, from educational materials such as National Science Textbooks or mass and social media (Strasburger et al., 2014).

5.3.2 Middle School Students' Views on Other People's Images of Human-Nature Relationship

Considering the views of students related to how other people have relationship with nature, in contrast to their own ideas on ideal human-nature relationship, they preferred to choose mostly Master type and they depicted in their drawings that humans mostly harm nature. The reason why students view other people's relationship with nature in a negative way might be due to where they reside. Since participants live in urban area, they might tend to observe more anthropocentric actions of humans, which can be associated with the Master type. To add, students in urban areas might confront negative impacts of deterioration of nature more often than students live in countryside (Ozsoy & Ahi, 2014; Barraza, 1999) because they may have affected from the wastes and noise of crowded, industrialized areas.

According to the results of this study, for views on other people's relationship with nature, students mentioned more HNR types compared to their own views on ideal relationships of human and nature. They mostly indicated multiple types for reflecting their views on other people's relationship have with nature. If discussed why students indicated more than one type might be due to fact that HNR type includes several dimensions and different values and images of nature have impact on the relationship between human and nature (Flint et al., 2013; Kloek et al., 2017). Furthermore, the findings of the study are parallel with the findings of van den Born (2007, 2008), Braitto et al. (2017) which is that people can hold multiple and competing HNR types. To illustrate, people might feel close to both Steward and Partnership types at the same time (van den Born, 2008). Multiple types on HNR

shared in the interview data might be due to the fact that participants in this study live in their own life-style, values, experiences and observations toward HNR.

In parallel with these two findings, while students depict relationships other people have with nature, they generally categorized humans into two categories by referring as '*bad*' people and '*good*' people. In their opinion, while bad people were associated with the types of Master and Apathy mostly; good people were linked with the characteristics of Steward, Participant, Partner and NDG types. The reason of such kind of finding might be due to the communication between humans generally categorized dichotomously such as being in good place- bad place; good people-bad people; right idea-wrong idea. It is also ascertained in the educational context that schools are generally based on evaluating students based on what is right and wrong, which idea is the right and better like done in the world for different situations (Alerby, 2000).

When considering the drawings of the students, it can be discussed that all of the students picturized other people's relationship between nature and humans with including elements like polluted waters, chimney smokes, gases from cars, humans-made buildings by replacing the trees, chopped trees regardless of their difference in grade levels. The similar elements in the drawings were made by Turkish students in the studies of Ozsoy and Ahi (2014); Sadık et al. (2011); Yardımcı and Kılıç (2010) while students were asked to draw environment. The reason might that observations from daily life heavily impact on views of students (Ozsoy, 2012).

Furthermore, when they drew a clean, peaceful nature, they associated the relationship of other people with nature positively where humans are protecting, valuing and creating bonds with the nature. This finding of study is parallel with the result discussed in Ozsoy and Ahi (2014). According to Ozsoy and Ahi (2014), types of humans drew in pictures differs from each other based on students' views on environment and students are aware of mutualistic dependence of nature and humans. That is why, students who see the nature as unspoiled place, generally

depicted humans as Stewards, Partners or Participants in their drawings; or contrary, they associated the types of other people as Master and Apathy.

Additionally, some of the students anthropomorphize the components of nature in their drawings. While some of them drew sun and clouds with sad faces, some of them depicted animals and plants as sad looking. These kind of anthropomorphic interpretations of students might be related that they can make empathy towards nature and trying to feel other livings, which were seen as qualities of moral developments (Nevers et al., 2006). According to Nevers, Billman-Mahecha and Gebhard (2006), students conceive natural components as moral objects. In this sense, in this study, the students might try to show their moral aspects towards the nature.

The students were generally viewed other humans' relationship with nature as Master, Apathy or User types. Parallely, in their drawings, the students depicted humans while cutting trees, construct buildings, becoming industrialized, causing forest fires, polluting water resources, throwing garbage on the ground, using natural resources and polluting air with the gases out of the factories due to the lack of usage of filter attachments in the chimneys. The reason behind their reflections on the drawings might be associated with middle school science education program (MoNE, 2018c). National Science Textbooks (MoNE, 2018b) has an emphasis on the impact of humans on the environment by air pollution, soil pollution and water pollution in the topic of Human-Environment Relationship of fifth grade levels. Therefore, views of students about how other humans have a relationship with nature might be related to the discourses in the textbooks, as well as the shared drawings such as gases released from the chimneys, car exhausts, oil spills in water, litters on the ground and in water resources.

All in all, when students were asked to express their views on images of human-nature relationship, the students shared their opinions by aiming at some actions such as littering on the ground, cutting trees, building houses in their drawings. It might be due to the challenge of converting abstract thoughts into a more concrete material

like a picturing actions. Therefore, the students might have drawn their pictures by including some actions in order to transform their own abstract thoughts and convey them in a more concrete way (Braitto et al., 2017).

5.4 Interrelation between Three Components of Visions of Nature

As encountered in the present and previous studies in the literature, students overwhelmingly expressed favorable emotions toward nature. By considering previous findings, it is addressed that children who are having positive feelings toward nature seem to reinforce meaningful interactions with nature, care nature more, and protect nature (Rios & Menezes, 2017). This relation between children's feelings and their interaction with nature can be also seen in the findings of the present study, which is explained in the following parts.

According to Flint et al. (2013), when humans are feeling negative emotions toward nature, they generally see the relationship of humans with nature like Master type in which they view themselves as the superior and controller over nature. Oppositely, when humans bear feelings to nature in a positive way, they considered the appropriate human-nature relationship as Stewards, Participants of Partners of nature. Concordantly to Flint et al. (2013), in this study, most of the participants depicted their own idea about images of appropriate human-nature relationship as Steward and Partner type. Additionally, all of the participants expressed favorable emotions toward nature, even some of them told that they scared from bugs, insects or birds. In other words, all of the students expressed their positive emotions related to nature and at the same time their own views on HNR types were identified mostly as Stewards and Partners which have emphasis on the idea that 'nature should be protected by humans' and 'the humans and nature have equal value'. The tendency toward feeling positive toward nature and selecting positive types such as Steward might be arised from the emotional affinity toward nature direct people to interest with nature and lead them to take protective decisions (Kals et al., 1999).

According to Alerby (2000), perceptions of humans help them to experience, and these experiences make these thoughts real and turn into something meaningful, and lastly all of these meaningful experiences show an influence of the way of people perceive. In other words, thoughts are given shape by the past experiences. The participants were asked to share their past experiences in nature while interviewer is trying to make them engage in the study with the help of the demographical questions. When considering the experiences of participants in nature, they generally expressed that they and their family go to the picnic. This might be due to the fact that since the data was collected from the students who live in city centers, they associated their nature experiences with picnic area where is greener, less crowded, less polluted and wider open spaces in contrast to city centers. In other words, students past experiences can shed light on their images of nature visualized.

Additionally, supportive evidence can be provided by van den Born et al. (2001) related to how past nature experiences has an effect on images of nature of students. More physical experiences in nature might lead students to view nature as wild; while less past experiences spent in nature associated with the arcadian nature where there generally meadows, heathlands exist (van den Born et al., 2001). When looking from this aspect, experiences of students were generally limited with 'going to picnic', by picturizing the place as out of city, with animals such as ducks, cats, dogs, lambs, birds and which is a greenery area such as meadows. By comparing with this previous research in literature, it can be said that the students of this study have less experiences in nature, which might be due to their less interaction with natural surroundings in city life-style.

By considering the rapidly developing technology in this age, it is inevitable to ignore technology and how students relate with technology. Technological enhancements are seen as one the factors that affect the students' views of nature. In the literature, when views of students toward technologically advanced environment were compared, it was found that fifth grade students indicated technology more dominantly than younger age groups such as first graders (Ozsoy & Ahi, 2014). In this study, on the other hand, when students were asked to imagine nature, most of

them did not include technological tools in their imagery. It might be explained by that the participants defined nature as a place distant from city centers, where the green places exist more and lack of internet connection.

van den Born (2008) indicated that the people who support the idea that humans are part of nature, generally embrace and share ideas related to intrinsic value of nature. In contrast to this situation, in the present study, although the students generally indicated that humans are part of nature, they provided different reasons under the instrumental values. Besides, two other participants who hold intrinsic values were not identified as Participant type, which includes characteristics like 'feeling as a part of nature', instead they viewed the human-nature relationship as 'Steward' type. It might be due to the fact that when students were asked why they think that humans are part of nature; being a part of nature was viewed by most of the students as protecting nature, living in the same world with other livings and help each other, having equal value with other livings and reciprocity between nature and humans. Contrary to results of van den Born (2008), participants of this study associated 'humans as part of nature' with the Stewards and Partnership, instead of matched HNR type as Participant in the literature.

Contrary to literature, the participants showed instrumental values while explaining the reasons why humans as part of nature. This might be due to the cultural differences. Since collectivistic cultures are more prone to give importance protection and fragility of nature, societies' responsibility toward nature (Li & Ernst, 2015), participants might feel close Steward and Partner mostly. In fact, this finding can also be seen in the Duong and van den Born's (2019) study that types of Steward, Partner and Participant were named under the category of 'Family with nature' because family members protect and give equal value to each other.

When considering the instrumental values students have, even though they do not explicitly feel close to User type, they might implicitly have the User type as their own ideas on images of human-nature relationship. They might see the nature as a place to acquire resources to meet their survival needs. This result of the study echoes

the findings of Pointon (2014). In Pointon's (2014) study, students also responded that the nature is for human survival and these responses were categorized as utilitarian, which is close to the characteristics of instrumental values and type of User in the present study. The reason why participants generally have the instrumental value about nature and see it as important for human survival might be due to fact that they might view nature as a supplier of their resources, which also in line with the Ecosystem Services notion. This might be also explained with the anthropocentric traditions in Turkish culture related to earn their lives such as by farming, stockbreeding in the Anatolian region, beekeeping, and fishery in the Black Sea region. By agreeing with what Bonnett (2004) stated that students might suffer from lack of interaction with nature and this might be interrelated with their view of using of nature. In other respect, when considering educational aspect, in the topic of Sustainable Development of eighth grade Turkish Science Curriculum (MoNE, 2018a, 2018c), efficient usage of natural resources were mentioned explicitly. That might be the explanation of why participants generally value nature instrumentally for meeting basic needs and sometimes touch on in the interview by stating 'natural resources can be used by not excessively'.

When considering the relation between images of nature and values of nature, from the result of Bujis (2009), it can be argued that since images of nature of students is generally corresponds to place like forest, away from city life, without human impact and artifact, in a word if it is wilderness image; people's values are expected to be shown as intrinsic value. On the contrary, in this study, although students have the nature image as pristine nature, greenery and free from human intervention, students have the value of instrumental value and provide reasons that similar to image of 'functional nature' as addressed in the Bujis (2009). They generally focused on the utility of nature and see its importance as supply provider. The reason might be that when the participants are asked to imagine nature by guided-imagery technique, they might imagined a nature they desired to happen. For this reason, although they imagined a place like real nature, wilderness image of nature as stated in Bujis,

(2009), they actually might see wild nature as a raw material supplier which value nature instrumentally from utilitarian perspective.

Apart from this, Bujis (2009) stated that in 'aesthetic image' is indicated as 'weak antropocentric' value, which can be regarded in this study as 'beauty of nature' under the 'neither instrumental, nor intrinsic value' category. In the aesthetic image, the beauty of landscapes were indicated. Furthermore, usage of nature by focusing on the recreation of humans in nature is regarded as important in Bujis' study (2009) and indicated it is indicated as instrumental value in van den Born (2008). The present study also echoes the results of Bujis (2009) and van den Born (2008) such that some of the students give reasons for importance of nature for providing recreational areas and embrace instrumental value by giving reason that imagined clean, green, natural areas for leisure times.

When looking at the interrelations between images of relationship and images of nature, Bujis (2009) indicated that people with wilderness image focus on the protection of species in ecosystem. When looking at the students own ideas on ideal relationship between nature, Steward type can be seen which has a big idea of protection of nature. Therefore, findings of present study might be related with the Bujis' article (2009) that the students of this study emphasized mostly on 'Steward' type and visualized the nature as untouched places, purged from human impacts and forests like wilderness image (Bujis, 2009).

In the present study, in order to explain humans' relationship with nature, participants used metaphors, shared their ideas by using abstract concepts and symbols. To illustrate, while one of the eighth grade students use the tree as a symbol for whole nature and the human with axe for the all other people; one of the fifth grade student used a hourglass for metaphor to show how humans impact on nature in time. Besides, one of the eighth grades depicted a bridge to show an interrelation between natural area and where human live; another fifth grade student used a term as a metaphor called 'Boomerang' to explain relationship between the humans' impact on nature and how nature response to humans eventually. Since formal

operational level requires thinking abstract concepts, shows usage of symbols and metaphors for these abstract parts (Macomber, 1977), especially some students might be considered to have characteristics of formal operational stage.

5.5 Educational Implications

Schools have the potential of raising globally aware citizens and are seen as promoter of the environmentally responsible behaviors (Barraza, 2001). Besides, education is regarded as a factor that enables next generations to take a role in the society (Ansell, 2006). In this respect, environmental education programs and aspects of sustainability in the curricula of schools can have an impact on how and what students learn regarding ‘nature’ and ‘environment’ notions (Ferguson, 2008). Moreover, environmental education (EE) and education for sustainable development (ESD) programs help to reinforce the connection between the nature and children and make them seek living in harmony with nature (IUCN, UNEP, WWF, 1991; Flowers et al., 2015). For these reasons, this study can provide multiple educational implications triggered by the students’ visions of nature.

First, since environmental education programs are generally covered from a single point of view, which is generally anthropocentric (Flint et al., 2013) and attributed instrumental value to the nature, the present study might be a guiding light for teachers and education authorities to identify the differences among students’ worldviews regarding human-nature relationship. In this study, students mostly focused on the instrumental values, which are defined as functional for humankind according to van den Born (2008). In parallel with this finding, in textbooks of Turkish Science Curriculum, there can be provided some examples related to how value towards nature is integrated mainly considering the human welfare in the fifth grade science textbook such as ‘*Humans need nature to meet their needs and survive.*’ (MoNE, 2018b, p. 155); ‘*Natural problems affect most of the livings, particularly humans, negatively.*’ (MoNE, 2018b, p. 159). For these reasons, instead of educating children from only single, anthropocentric point of view and by solely

implementing some instructional activities emphasizing the instrumental value of nature, different perspective such as intrinsic value of nature, which were also detected in children's worldviews, should be implemented to the environmental education programs explicitly.

According to Sadık, Çakan and Artut (2011), when providing students visuals and dilemmas related to environment, students might be encouraged to decide on which actions and views on nature approved or not. By considering these, with the help of the construct of this study, teachers can create discussion environments by using some contradicting ideas related to HNR, with the visuals such as Master type card and Participant type card to encourage them to brainstorm on these views of human-nature relationship. In this way, with the help of the findings of this study, teachers might prepare more meaningful classes about natural places and indicate the human-nature relationship from different perspectives by considering the variety of worldviews that student might have. As a result, while considering revisions in the environmental education programs, instead of embarking on strict frameworks and overloading the content knowledge, field experts can give space for students to develop their own decisions, own sense of self and their surroundings (Rios & Menezes, 2017). In this way, it might be achieved to raise children who are more aware about their visions of nature and more willing to take decisive actions for the sake of the nature.

According to the findings of the study, while in the view of the participants, there can be seen environmental, economic and social aspect; however, political dimensions of the humans relationship with nature were not emphasized by the students. Lack of emphasis on political dimension might be due to the absence of policy education in the curricula (Rios & Menezes, 2017). Over the decades, children are ignored as citizens and did not considered as the environmental stakeholders. In fact, children were seen as incapable to understand aspects of sustainable development (Cohen & Horm-Wingerd, 1993). For this reason, considering the inferences made by the present study, to raise comitted, environmentally aware individuals alongside the environmental education, political and citizenship

education can be implemented to the curricula. In this way, children can take their own responsibilities for protecting nature, aware of the environmental problems and construct cause-effect relationship easily and become willing to participate as environmental stakeholders (Hacking, Scott, & Barratt, 2007). Besides, if students are taught with additional political dimensions, they can critically decide on their community's rules and applications related their surroundings (Rios & Menezes, 2017). Lastly, since sustainable development does not solely include environmental dimension, understanding other dimensions such as economy and policy might help students to think the sustainable development for their country as a whole, rather than thinking on merely the natural aspect from scientific point of views (Pointon, 2014).

In this study, students generally mentioned relationship between other people and nature negatively. They generally depicted urbanization and deterioration of natural places in their drawings with the elements such as humans cutting trees, polluting nature. Students who are living in the city center imagined themselves away from buildings, in place of where they can see colour of green in their nature visualizations. In accordance with the views of participants, since it is predicted that until 2050 urban settlements will comprise of 68% of the total human population (United Nations & World Urbanization Prospects 2018), it becomes harder to make students interact with the nature than today, in the next decades. To increase students' interaction with nature and natural experiences in cities, researchers agree with the call of civic ecology made by the Krasny and Tidball (2009). Although it is generally perceived that ecological content can be learned in the class environment, social environment and interactive participation process can enable students to learn more meaningfully (Illeris, 2007). Besides, Miller (2007) and Ozsoy and Ahi (2014) argue that education systems make students keep away from the natural environments.. For these reasons, to try not to detach from nature, programs and projects should be implemented in the educational context by considering out-of-school, outdoor education options, such as Garden Mosaics educational program that is largely applied as an out-of-school program in US, Canada and South Africa

(Krasny & Tidball, 2009) and Get to Know international program (Bruni et al., 2017) that designed to connect youth with the nature, other people and themselves. In conclusion, alternative implications such as outdoor education programs for being in touch with nature may help students to increase experiences in nature which in turn affect their views towards nature in a positive way.

By considering the findings emerged from the present study and supporting them with the literature, educational implications especially for the environmental education and education for sustainable development were discussed. The suggestions for the further studies in different contexts were provided in the next section.

5.6 Suggestions for Further Studies

In this study, visions of nature of students were examined under three main components, which investigates views of nature, reasons given for importance of nature and relationships between human and nature. Since present study was conducted with the fifth and eighth grade students, as further study, same context of the study can be conducted with different grade levels, age groups or with the students who live in rural areas. In this way, more general inferences can be made for the views on nature and HNR types of middle school students in Turkey.

In the study, point of view on the technology and its effect on the relationships of humans with nature were slightly mentioned in the card selection tool while introducing the HNR types. Although technology was not the main scope of the present study, students shared their opinion on how technology influences nature and the life of other livings. Educational studies have to take into account technology aspect broadly in order to understand the relationship of nature with human beings for the future generations. For this reason, context of this study can be extended with the technology aspects in the further studies. New quantitative scales for HNR types and aspect of technology can be developed for both enhancing the technology for the

sake of nature and humans and educations for students. Additionally, as Dietz, Fitzgerald and Schwom (2005) stated that technological aspect did not include value concepts generally. That is why, values of nature and technological choice of students can be suggested to investigate.

It is realized and discussed in the previous sections that drawings and explanations of the students might be affected by the statements included in the textbooks of the national curricula. For this reason, to be able to understand what kind of metaphors and hidden messages are sending to the children in environmental context, textbooks of the Turkish Science Curricula can be analyzed by considering pictures, sentences regarding the values of nature, images of nature and images of human-nature relationship. The hidden messages might be embedded in the textbooks can be examined with the help of the content analysis for each grade levels in the further studies. In this way, educators can revise programs to reshape and direct students to think in more environmentally friendly manner without having only instrumental values towards nature, but alongside aiming to increase intrinsic values toward nature.

According to Stern and Dietz (1994), worldviews of people can differ between cultures and they also support that apart from the cultural differences, worldviews can change from person to person or between socially-structured groups. Supportingly, Li and Ernst (2015) mentioned that people can have different worldviews which are attributed by their own cultures both within-country and between-country. As Turkey is a transcontinental city, it is a culturally diversified country (Aydın, 2012). Since the reign of the Ottoman Empire, geography of Turkey become a home for variety of ethnicities and cultures. This heterogeneity might let researchers study with different ethnic groups and cultural background by using same context to examine cultural differences seen in Turkey. Similarly, HNR types that students chose in the study can be examined by considering the differences between socio-economic status, religions or according to their place of residence such as rural and urban areas.

Apart from these, quantitative studies can be conducted with the same framework of present study in the further studies. Preference of the students regarding HNR types can be compared in the light of the cognitive development levels of Piaget and moral development levels of Kohlberg. HNR types of the students can be correlated with the help of the mixed method. In this way, preferences of students regarding types of HNR can be discussed by considering and correlating their developmental stages in both cognitive and moral aspects.

As a suggestion for the further studies, the reasons behind views of students regarding nature and human-nature relationship can be analyzed whether students mostly affected by their impacts and thoughts of parents, from their school curricula, from media channels or solely from their experiences in nature. These possible reasons may be ranked according to its influence amount on the students' views by conducting a quantitative study.

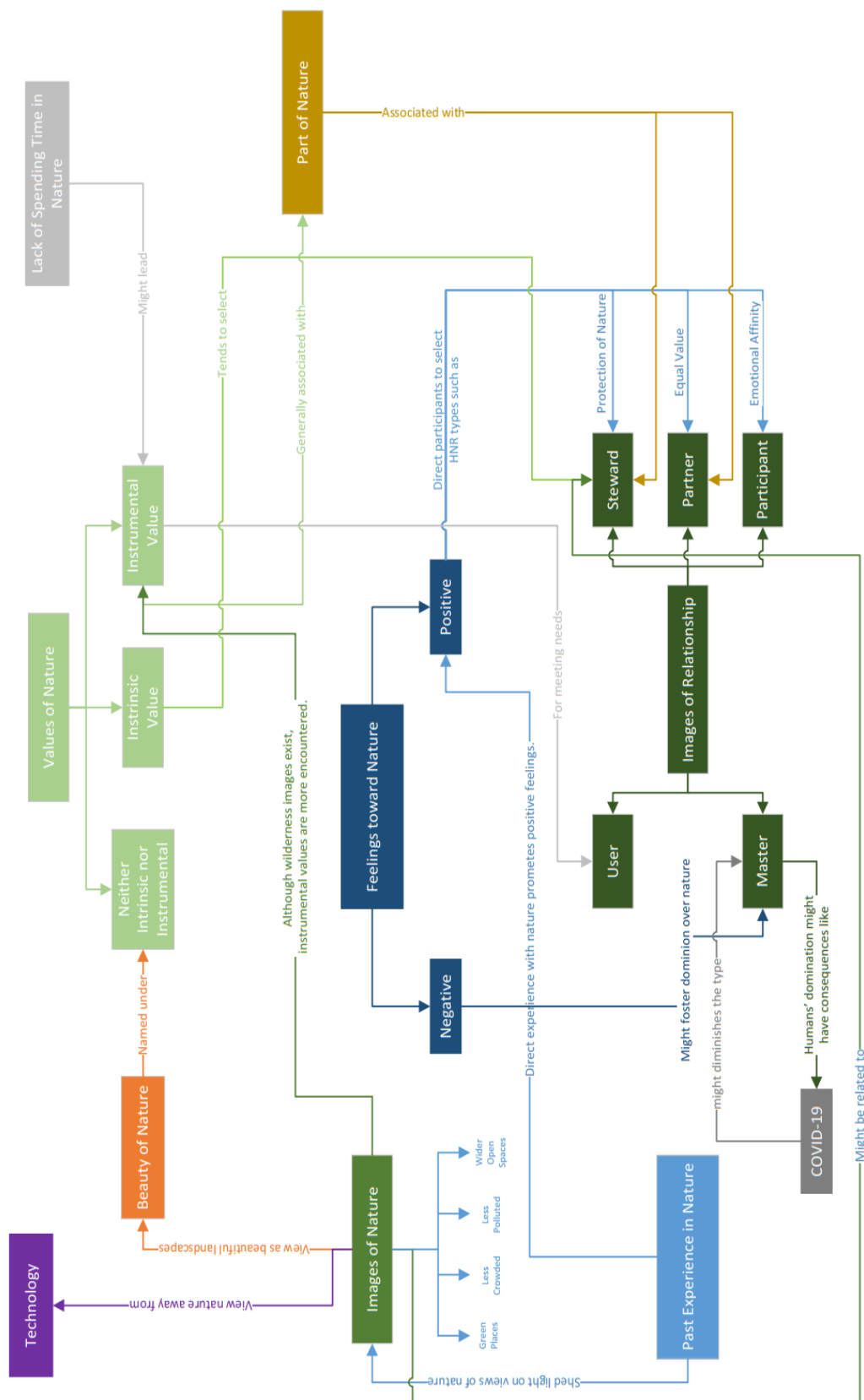
In the literature, it is indicated that environmental behaviors might be explanatory for the views of people toward the types of HNR. Braito et al. (2017) found that while Apathy, Master and NDG show a negative correlation with the pro-environmental behaviors; types of User, Steward, Partner and Participant correlated positively. Nevertheless, since the scope of the study did not include environmental behaviors, in the further studies relationship between the HNR types and environmental behaviors of students may be examined (Flint et al., 2013). Moreover, as the framework of the study suggested that the present research was analyzed in a general sense. Further studies might be conducted in a specific context related to visions of nature.

In the further studies, traces of religions on visions of nature may be investigated. In fact, comparative studies may be conducted to understand to what extent religious beliefs affect the views of students toward nature, how the relationship of humans change with the changing beliefs and whether there exist differences between different religious belief systems and visions of nature of the students.

5.7 Summary of Discussion

The Figure 5-1. was presented to show the interrelationship between the analysis and their possible reasons. In the figure, three components of visions of nature: images of nature, image of human-nature relationship and value of nature can be seen separately and their relation with other components were constructed. Other factors such as leisure activities and experiences in nature, technology and COVID-19 was also added to show the relationship of these with three main components of students' visions of nature.





REFERENCES

- Adams, S., & Savahl, S. (2015). Children's Perceptions of the Natural Environment: A South African Perspective. *Children's Geographies*, 13(2), 196-211. <https://doi.org/10.1080/14733285.2013.829659>
- Adams, S., & Savahl, S. (2017). Children's Discourses of Natural Spaces: Considerations for Children's Subjective Well-Being. *Child Indicators Research*, 10, 423-446. <https://doi.org/10.1007/s12187-016-9374-2>
- Alerby, E. (2000). A Way of Visualizing Children's and Young People's Thoughts about the Environment: a study of drawings. *Environmental Education Research*, 6(3), 205-222. <https://doi.org/10.1080/13504620050076713>
- Anderson, S., & Moss, B. (1993). How wetland habitats are perceived by children:: consequences for children's education and wetland conservation. *International Journal of Science Education*, 15(5), 473-485. <http://dx.doi.org/10.1080/0950069930150502>
- Änggård, E. (2010). Making Use of 'Nature' in an Outdoor Preschool: Classroom, Home and Fairyland. *Children, Youth and Environments*, 20(1), 4-25.
- Ankara Developmental Agency. (2018). *İstatistiklerle Ankara- Yıllar İtibarıyla İllere göre Kişi Başına Yeşil Alan Miktarı (m2)*. Ankara Kalkınma Ajansı: <https://istatistik.ankaraka.org.tr/cizelge/2020/155>
- Ansell, N. (2006). Children, education and sustainable development in Lesotho. In J. Hill, A. Terry, & W. Woodland (Eds.), *Sustainable development: National aspirations, local implementation* (s. 115-135). Aldershot: Ashgate: Routledge.
- Ardoin, N., Clark, C., & Kelsey, E. (2012). An Exploration of Future Trends in Environmental Education Research. *Environmental Education Research*, 19(4), 499-520. <http://dx.doi.org/10.1080/13504622.2012.709823>

- Artut, K. (2002). *Sanat eğitimi kuramları ve eğitimi*. Ankara: Anı yayıncılık.
- Atasoy, V., & Ahi, B. (2019). A phenomenographic investigation into preschool children's relationships with nature through drawings. *International Research in Geographical and Environmental Education*, 28(4), 281-295. <https://doi.org/10.1080/10382046.2019.1649248>
- Aydın, H. (2012). Multicultural Education Curriculum Development in Turkey. *Mediterranean Journal of Social Sciences*, 3(3), 277-286. <https://doi.org/10.5901/mjss.2012.v3n3p277>
- Barbour, I. (1980). *Technology, Environment, and Human Values*. New York: Preager Publishers. <https://doi.org/10.1177/016224397600600111>
- Barraza, L. (1999). Children's Drawings about the Environment. *Environmental Education Research*, 5(1), 49-66. <https://doi.org/10.1080/1350462990050103>
- Barraza, L. (2001). Environmental education in Mexican schools: The primary level. *Journal of Environmental Education*, 32(3), 31-36. <https://doi.org/10.1080/00958960109599143>
- Bauer, N., Wallner, A., & Hunziker, M. (2009). The change of European landscapes: Human-nature relationships, public attitudes towards rewilding and the implications for landscape management in Switzerland. *Journal of Environmental Management*, 90, 2910-2912. <https://doi.org/10.1016/j.jenvman.2008.01.021>
- Bennett, N., Roth, R., Klain, S., Chan, K., Clark, D., Cullmann, G., & Epstein, G. (2016). Mainstreaming the Social Sciences in Conservation. *Conservation Biology*, 31(1), 56-66. <https://doi.org/10.1111/cobi.12788>
- Bogdan, R., & Biklen, S. (2007). *Qualitative Research for Education*. Boston: Pearson.

- Bonnett , M. (2007). Environmental education and the issue of nature. *Journal of Curriculum Studies*, 39(6), 707-721.
<https://doi.org/10.1080/00220270701447149>
- Bonnett, M. (2004). Lost in Space? Education and the Concept of Nature. *Studies in Philosophy and Education*, 23, 117-130.
- Bonnett, M., & Williams, J. (1998). Environmental Education and Primary Children's Attitudes towards Nature and the Environment. *Cambridge Journal of Education*, 28(2), 159-174.
<https://doi.org/10.1080/0305764980280202>
- Bordeu, P. (2004). The man-nature relationship and environmental ethics. *Journal of Environmental Radioactivity*, 72(1-2), 9-15.
[https://doi.org/10.1016/S0265-931X\(03\)00180-2](https://doi.org/10.1016/S0265-931X(03)00180-2)
- Bowker, R. (2007). Children's perceptions and learning about tropical rainforests: an analysis of their drawings. *Environmental Education Research*, 13(1), 75-96.
<https://doi.org/10.1080/13504620601122731>
- Bögeholz, S. (1999). *Qualitäten primärer Naturerfahrung und ihr Zusammenhang mit Umweltwissen und Umwelthandeln*. Wiesbaden: Springer.
- Bögeholz, S. (2006). Nature experience and its importance for environmental knowledge. values and action: Recent German empirical contributions. *Environmental Education Research*, 12(1), 65-84.
<http://dx.doi.org/10.1080/13504620500526529>
- Braitto, M., Böck, K., Flint, C., Muhar, A., Muhar, S., & Penker, M. (2017). Human-Nature Relationships and Linkages to Environmental Behavior. *Environmental Values*, 26, 365-389.
<https://doi.org/10.3197/096327117X14913285800706>

- Bruni, C., & Schultz, P. (2010). Implicit beliefs about self and nature: Evidence from an IAT game. *Journal of Environmental Psychology*, 30, 95-102. <https://doi.org/10.1016/j.jenvp.2009.10.004>
- Bruni, C., Winter, P., Schultz, P., Omoto, A., & Tabanico, J. (2017). Getting to know nature: evaluating the effects of the Get to Know Program on children's connectedness with nature. *Environmental Education Research*, 23(1), 43-62. <https://doi.org/10.1080/13504622.2015.1074659>
- Bujis, A. E. (2009). Lay People's Images of Nature: Comprehensive Frameworks of Values, Beliefs and Value Orientations. *Society and Natural Resources*, 22(5), 417-432. <https://doi.org/10.1080/08941920801901335>
- Bujis, A., Elands, B., & Langers, F. (2009). No wilderness for immigrants: Cultural differences in images of nature and landscape preferences. *Landscape and Urban Planning*, 91, 113-123. <https://doi.org/10.1016/j.landurbplan.2008.12.003>
- Cetin, M. (2019). Effects of Religious Participation on Social Inclusion and Existential Well-Being Levels of Muslim Refugees and Immigrants in Turkey. *The International Journal for the Psychology of Religion*, 29(2), 64-76. <https://doi.org/10.1080/10508619.2019.1580092>
- Cohen, S., & Horm-Wingerd, D. (1993). Children and the environment: Ecological awareness among preschool children. *Environment and Behavior*, 24(1), 103-120.
- Collado, S., Íñiguez-Rueda, L., & Corraliza, J. (2016). Experiencing nature and children's conceptualizations of the natural world. *Children's Geographies*, 14(6), 716-730.
- Colucci-Gray, L., Camino, E., Barbiero, G., & Gray, D. (2006). From Scientific Literacy to Sustainability Literacy: An Ecological Framework for Education. *Wiley InterScience*, 227-252. <https://doi.org/10.1002/sce.20109>

- Conservation International. (2020). *Nature+Coronavirus Brief*.
https://www.conservation.org/docs/default-source/publication-pdfs/ci_nature_coronavirus_brief_may2020.pdf?sfvrsn=417c3145_2
- Creswell, J. (2007). *Qualitative Inquiry & Research Design: Choosing among five approaches*. London: Sage Publications.
- Cukur, C., De Guzman, M., & Carlo, G. (2004). Religiosity, Values, and Horizontal and Vertical Individualism—Collectivism: A Study of Turkey, the United States, and the Philippines. *The Journal of Social Psychology*, 144(6), 613-634.
- de Groot, M., & de Groot, W. (2009). 'Room for river' measures and public visions in Netherlands- A survey on river perceptions among riverside residents. *Water Resources Research*, 45(7), 1-11.
<https://doi.org/10.1029/2008WR007339>
- de Groot, M., Drenthen, M., & de Groot, W. (2011). Public visions of the human-nature relationship and their implications for environmental ethics. *Environmental Ethics*, 33(1), 25-44.
<https://doi.org/10.5840/enviroethics20113314>
- de Groot, W. (1992). *Environmental Science Theory: Concepts and Methods in a ProblemOriented, One-World Paradigm*. Amsterdam: Elsevier Science Publishers .
- de Groot, W., & van den Born, R. (2003). Visions of nature and landscape type references: An exploration in the Netherlands. *Landscape and Urban Planning*, 127-138. [https://doi.org/10.1016/S0169-2046\(02\)00184-6](https://doi.org/10.1016/S0169-2046(02)00184-6)
- Denzin, N. (1978). *The Research Act: A Theoretical Introduction to Sociological Methods*. New York: McGraw - Hill.

- Dietz, T., Fitzgerald, A., & Schwom, R. (2005). Environmental Values. *Annu. Rev. Environ. Resour.*, 30, 335-372.
<https://doi.org/10.1146/annurev.energy.30.050504.144444>
- Diffenbaugh, N., Field, C., Appel, E., Azevedo, I., Baldocchi, D., Burke, M., . . . Wong-Parodi, G. (2020). The COVID-19 lockdowns: a window into the Earth System. *Nature Reviews: Earth & Environment*, 1, 470-481.
<https://doi.org/10.1038/S43017-020-0079-1>
- Dopko, R., Capaldi, C., & Zelenski, J. (2019). The psychological and social benefits of a nature experience for children: A preliminary investigation. *Journal of Environmental Psychology*, 63, 134-138.
<https://doi.org/10.1016/j.jenvp.2019.05.002>
- Duffus, D., & Dearden, P. (1990). Non-Consumptive Wildlife-Oriented Recreation: A Conceptual Framework. *Biological Conservation*, 53, 213-231.
[https://doi.org/10.1016/0006-3207\(90\)90087-6](https://doi.org/10.1016/0006-3207(90)90087-6)
- Dunlap, R., Van Liere, K., Mertig, A., & Jones, R. (2000). Measuring Endorsement of the New Ecological Paradigm: A revised NEP Scale. *Journal of Social Issues*, 56(3), 425-442.
- Duong, N., & van den Born, R. (2019). Thinking about Nature in the East: An Empirical Investigation of Visions of Nature in Vietnam. *Ecopsychology*, 11(1), 1-13. <https://doi.org/10.1089/eco.2018.0051>
- Education, N. A. (2007). *Standards for the Initial Preparation of Environmental Educators*. NAAEE.
- Edwards, R., & Larson, B. (2020). When screens replace backyards: strategies to connect digital-media-oriented young people to nature. *Environmental Education Research*, 26(7), 950-968.
<https://doi.org/10.1080/13504622.2020.1776844>

- Elo, S., & Kyngas, H. (2008). The qualitative content analysis. *Journal of Advanced Nursing*, 62(1), 107-115.
- Ernst, J., & Theimer, S. (2011). Evaluating the effects of environmental education programming on connectedness to nature. *Environmental Education Research*, 17(5), 577-598. <http://dx.doi.org/10.1080/13504622.2011.565119>
- European Commission. (2020). *Eurydice: Population, Demographic Situation, Languages and Religions*. EACEA National Policies Platform: <https://eacea.ec.europa.eu/national-policies/eurydice adresinden alindi>
- Ferguson, T. (2008). 'Nature' and 'Environment' in Jamaica's Primary School Curriculum Guides. *Environmental Education Research*, 14(5), 559-577. <https://doi.org/10.1080/13504620802345966>
- Fien, J., & Tilbury, D. (2002). The Global Challenge of Sustainability. In D. Tilbury, R. Stevenson, J. Fien, & D. Schreuder (Eds.), *Education and Sustainability: Responding to the Global Challenge* (pp.1-12). Cambridge: Commission on Education and Communication, IUCN.
- Fischer, A., & Young, J. (2007). Understanding mental constructs of biodiversity: Implications for biodiversity management and conservation. *Biological Conservation*, 136, 271-282. <https://doi.org/10.1016/j.biocon.2006.11.024>
- Fletcher, R. (2017). Connection with nature is an oxymoron: A political ecology of “nature-deficit disorder”. *The Journal of Environmental Education*, 48(4), 226-233. <https://doi.org/10.1080/00958964.2016.1139534>
- Flint, C., Kunze, I., Muhar, A., Yoshida, Y., & Penker, M. (2013). Exploring empirical typologies of human–nature relationships and linkages to ecosystem services. *Landscape and Urban Planning*, 120, 208-217. <http://dx.doi.org/10.1016/j.landurbplan.2013.09.002>

- Flowers, A., Carroll, J., Green , G., & Larson, L. (2015). Using Art to Assess Environmental Education Outcomes. *Environmental Education Research*, 21(6), 846-864. <https://doi.org/10.1080/13504622.2014.959473>
- Fraenkel , J., Wallen, N., & Hyun, H. (2012). *How to design and evaluate research in education*. Mc Graw Hill.
- Fromm, E. (1973). *The Anatomy of Human Destructiveness*. Canada: Holt, Rinehart and Winston .
- Galyean, B.-C. (1981, Fall). Guided-Imagery in Education. *Journal of Humanistic Psychology*, 21(4), 57-68.
- Galyean, B.-C. (1982). The Use of Guided-Imagery in Elementary and Secondary Schools. *Imagination, Cognition and Personality*, 2(2), 145-151. <https://doi.org/10.2190/1AJ0-N9L9-0RMD-NDBX>
- General Directorate of Forestry. (2019). Rekreeasyon alanlarının il düzeyinde dağılımı, 2019. <https://www.ogm.gov.tr/tr/ormanlarimiz/resmi-istatistikler>
- Goldman, D., Assaraf, O.-Z., & Shemesh, J. (2014). Human-Nature: Chemical engineering students' ideas about human relationships with the natural world. *European Journal of Engineering Education*, 39(3), 325-347. <http://dx.doi.org/10.1080/03043797.2013.867313>
- Guba, E., & Lincoln, Y. (1981). *Effective Evaluation: Improving the Usefulness of Evaluation Results Through Responsive and Naturalistic Approaches*. San Francisco: Jossey-Bass Publishers.
- Gunindi, Y. (2012). Environment in My Point of View: Analysis of the Perceptions of Environment of the Children Attending to Kindergarten through the Pictures They Draw. *Social and Behavioral Sciences*, 55, 594-603. <https://doi.org/10.1016/j.sbspro.2012.09.541>

- Hacking, E., Scott, W., & Barratt, R. (2007). Children's Research into Their Local Environment: Stevenson's Gap and Possibilities of the Curriculums. *Environmental Education Research*, 13(2), 225-244.
- Hallås, B., & Heggen, M. (2018). "We Are All Nature"—Young Children's Statements About Nature. In N. Goga, L. Guanio-Uluru, B. Hallås, & A. Nyrnes (Eds.), *Ecocritical Perspectives on Children's Texts and Cultures* (s. 259-274). https://doi.org/10.1007/978-3-319-90497-9_16
- Heerwagen, J., & Orians, G. (2002). The Ecological World of Children. In P. Kahn, & S. Kellert (Eds.), *Children and Nature: Psychological, Sociocultural and Evolutionary Investigations* (pp. 29-63). Massachussets: The MIT Press.
- Hoover, K. (2020). Children in nature: exploring the relationship between childhood outdoor experience and environmental stewardship. *Environmental Education Research*, 1-17. <https://doi.org/10.1080/13504622.2020.1856790>
- Hughes, J., Richardson, M., & Lumber, R. (2018). Evaluating connection to nature and the relationship with conservation behavior in children. *Journal of Nature Conservation*, 45, 11-19. <https://doi.org/10.1016/j.jnc.2018.07.004>
- Hunka, A., De Groot, W., & Biela, A. (2009). Visions of nature in Eastern Europe: A Polish Example. *Environmental Values*, 18, 429-452. <https://doi.org/10.3197/096327109X12532653285777>
- Illeris, K. (2007). *How We Learn: Learning and Non-learning in School and Beyond*. London, UK: Routledge.
- Inaltekin, T., & Goksu, V. (2019). A Research on Visual Learning Representations of Primary and Secondary Science Textbooks in Turkey. *International Journal of Progressive Education*, 15(6), 51-65. <https://doi.org/10.29329/ijpe.2019.215.4>
- IUCN- UNEP- WWF. (1980). *World Conservation Strategy: Living Resource Conservation for Sustainable Development*.

- IUCN, UNEP, WWF. (1991). *Caring for the Earth: A strategy for Sustainable Development*. Gland, Switzerland.
- Jordan, K., & Kristjansson, K. (2017). Sustainability, virtue ethics, and virtue of harmony with nature. *Environmental Education Research*, 23(9), 1205-1229. <https://doi.org/10.1080/13504622.2016.1157681>
- Kahn, P. (2002). Children's Affiliations with Nature: Structure, Development, and the Problem of Environmental Generational Amnesia. In P. Kahn, & S. Kellert (Eds.), *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations* (pp. 93-116). Cambridge and London: The MIT Press.
- Kahn, P., & Kellert, S. (2002). *Children and Nature: Psychological, Sociocultural and Evolutionary Investigations*. The MIT Press.
- Kahn, P., Severson, J., & Ruckert, J. (2009). The human relation with nature and technological nature. *Current Directions in Psychological Science*, 18(1), 37-42.
- Kals, P., Schumacher, D., & Montada, L. (1999). Emotional affinity toward nature as a motivational basis to protect nature. *Environment and Behavior*, 31(2), 178-202. <https://doi.org/10.1177/00139169921972056>
- Kalvaitis, D., & Monhardt, R. (2012). The architecture of children's relationships with nature: a phenomenographic investigation seen through drawings and written narratives of elementary students. *Environmental Education Research*, 18(2), 209-227. <https://doi.org/10.1080/13504622.2011.598227>
- Kaplan, R., & Kaplan, S. (2002). Adolescents and the Natural Environment: A Time Out? In P. Kahn, & S. Kellert (Eds.), *Children and Nature: Psychological, Sociocultural and Evolutionary Investigations* (pp. 227-257). Massachusetts: The MIT Press.

- Keliher , V. (1997). Children's perceptions of nature. *International Research in Geographical and Environmental Education*, 6(3), 240-243.
<http://dx.doi.org/10.1080/10382046.1997.9965051>
- Kellert , S., & Wilson, E. (1993). *The Biophilia Hypothesis*. Washington,DC: Island Press.
- Kellert, S. (1985). Attitudes toward animals: Age-related development among children. In M. Fox, & L. Mickley (Eds.), *Advances in animal welfare science* (pp. 43-60). Washington, DC: The Humane Society of the United States.
- Kellert, S. (1996). *The Value of Life: Biological Diversity and Human Society*. Washington DC: Island Press.
- Kellert, S. R. (1993). The Biological Basis for Human Values of Nature. In S. Kellert, & E. Wilson (Eds.), *The Biophilia Hypothesis*. Island Press.
<https://doi.org/10.1177/027046769501500125>
- Kellert, S. R. (2002). Experiencing Nature: Affective, Cognitive and Evaluative Development in Children. In S. Kellert, & P. Kahn (Eds.), *Children and Nature: Psychological, Sociocultural and Evolutionary Investigations* (pp. 117-151). Massachusetts: The MIT Press.
- Kloek, M., Bujis, A., Boersema , J., & Schouten, M. G. (2017). Cultural echoes in Dutch immigrants' and non-immigrants' understanding and values of nature. *Journal of Environmental Planning and Management*, 61(5-6) 818-840.
<https://doi.org/10.1080/09640568.2017.1319803>
- Kockelkoren, P. (1993). *De vernieuwing van Nederland*. Locus Seminar
- Korfiatis, K., Stamaou, A., & Paraskevopoulos, S. (2004). Images of Nature in Greek Primary School Textbooks. *Science Education*, 88, 72-89.
<https://doi.org/10.1002/sce.10133>

- Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, 24(1), 120-124. <https://doi.org/10.1080/13814788.2017.1375092>
- Krasny , M., & Tidball, K. (2009). Community Gardens as Contexts for Science, Stewardship and Civic Action Learning. *Cities and Environment*, 2(1), 8-18. <https://doi.org/10.15365/cate.2182009>
- Kuckartz, U., & Radiker , S. (2019). *Analyzing Qualitative Data with MAXQDA: Text, Audio and Video*. Switzerland: Springer.
- Leopold, A. (1949). *A sand county almanac and sketches here and there*. New York: Oxford University Press.
- Levy, A., Orion, N., & Leshem, Y. (2018). Variables that influence the environmental behavior of adults. *Environmental Education Research*, 24(3), 307-325. <https://doi.org/10.1080/13504622.2016.1271865>
- Li, J., & Ernst, J. (2015). Exploring value orientations toward the human-nature relationship: a comparison of urban youth in Minnesota, USA and Guangdong, China. *Environmental Education Research*, 21(4), 556-585. <https://doi.org/10.1080/13504622.2014.910499>
- Liefländer, A. K., Fröhlich, G., Bogner, F. X., & Schultz, P. (2013). Promoting connected with nature through environmental education. *Environmental Education Research*, 19(3), 370-384. <https://doi.org/10.1080/13504622.2012.697545>
- Lincoln, Y., & Guba, E. (1985). *Naturalistic Inquiry* (1st ed.). London: Sage publications.
- Lincoln, Y., & Guba, E. (2005). Paradigmatic Controversies, Contradictions, and Emerging Confluences. In N. Denzin , & Y. Lincoln (Eds.), *The SAGE Handbook of Qualitative Research* (pp. 191-215). Thousand Oaks, California: SAGE Publications.

- Littledyke, M. (2004). Primary children's views on science and environmental issues: examples of environmental and moral development. *Environmental Education Research*, 10(2), 217-235. <https://doi.org/10.1080/13504620242000198186>
- Liu, S.-C., & Lin, H.-s. (2014). Undergraduate students' ideas about nature and human-nature relationships: an empirical analysis of environmental worldviews. *Environmental Education Research*, 20(3), 412-429. <https://doi.org/10.1080/13504622.2013.816266>
- Louv, R. (2018). *The Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder* (6th ed.). New York Workman: Algonquin Books of Chapel Hill.
- Macnaghten, P. (1993). Discourses of nature: argumentation and power. In E. Burman, & I. Parker (Eds.), *Discourse Analytic Research: Repertoires and Readings of Texts in Action*. (pp. 52-72). London: Routledge.
- Macomber, L. (1977). Some Implications of Jean Piaget's Theory for the Education of Young Children. In M. Appel, & L. Goldberg (Eds.), *Topics in Cognitive Development* (pp. 151-163). New York: Plenum Press.
- Mayring, P. (2004). Qualitative content analysis. In U. Flick, E. von Kardorff, & I. Steinke (Eds.), *A Companion to Qualitative Research* (pp. 266-269). SAGE Publications.
- Merino, A., Valor, C., & Redondo, R. (2020). Connectedness is in my character: the relationship between nature relatedness and character strengths. *Environmental Education Research*, 26(12), 1707-1728. <https://doi.org/10.1080/13504622.2020.1825630>
- Merriam, S. (1998). *Qualitative Research and Case Study Applications in Education: Revised and Expanded from Case Study Research in Education* (2nd ed.). San Francisco: Jossey-Bass Publishers.

- Merriam, S. B. (2009). *Qualitative Research: A Guide to Design and Implementation*. 2009: Jossey Bass- A Wiley Print.
- Mertens, D. (2012). Ethics in Qualitative Reserach in Education and the Social Sciences. In S. Lapan, M. Quartaroli, & F. Riemer (Eds.), *Qualitative Research: An Introduction to Methods and Design* (pp. 19-39). San Francisco: John Wiley and Sons.
- Meske, M. (2011). *Natur ist für mich die Welt: Lebensweltlich gepragte Naturbilder von Kindern*. Germany .
- Miles, M., & Huberman, A. (1994). *Qualitative data analysis: An expanded sourcebook*. (2nd ed.) SAGE Publications.
- Miller, D. (2007). The seeds of learning: Young children develop important skills through their gardening activities at a midwestern early education program. . *Applied Environmenral Education and Communication*, 6(1), 49-66. <https://doi.org/10.1080/15330150701318828>
- Ministry of Industry and Technology. (2018). Ankara İl Sanayi Durum Raporu . Ankara. <https://www.sanayi.gov.tr/plan-program-raporlar-ve-yayinlar/81-il-sanayi-durum-raporlari/mu0603011615>
- Ministry of National Education (MoNE). (2018a). *8.Sınıf Fen Bilimleri Ders Kitabı*. Ankara.
- Ministry of National Education (MoNE). (2018b). İnsan ve Çevre. In *5.Sınıf Fen Bilimleri Ders Kitabı*. Ankara.
- Ministry of National Education. (2018c). Fen Bilimleri Dersi Öğretim Programı.
- Muhar, A., & Böck, K. (2018). Mastery over nature as a paradox: societally implemented but individually rejected. *Journal of Environmental Planning and Management*, 61(5-6), 994-1010. <https://doi.org/10.1080/09640568.2017.1334633>

- Myers Jr., O., & Saunders, C. (2002). Animals as Links toward Developing Caring Relationships with the Natural World. In P. Kahn Jr., & S. Kellert (Eds.), *Children and Nature* (pp. 153-178). Massachusetts: The MIT Press.
- National Wildlife Federation, E.-S. U. (2015). Green STEM Initiative Guidebook. [https:// www.nwf.org/Eco-Schools-USA/About/STEM](https://www.nwf.org/Eco-Schools-USA/About/STEM)
- Nevers , P., Billman-Mahecha, E., & Gebhard, U. (2006). Visions of Nature and Value Orientations among German Children and Adolescents. In R. van den Born, W. de Groot, & R. Lenders (Eds.), *Visions of Nature: A scientific exploration of people's implicit philosophies regarding nature in Germany, Netherlands and the United Kingdom* (pp. 109-128). Transaction Publishers.
- Nisbet, E., Zelenski, J., & Murphy, S. (2009). The Nature Relatedness Scale. *Environment and Behavior*, 41(5) 715-740. <https://doi.org/10.1177/0013916508318748>
- Norton, B. (1991). *Toward Unity Among Environmentalists*. New York: Oxford University Press.
- Novick, S., & Nussbaum, J. (1978). Junior High School Pupils' Understanding of the Particulate Nature of Matter: An Interview Study. *Science Education*, 62(3), 273-281. <https://doi.org/10.1002/sce.3730620303>
- Ozsoy, S. (2012). Investigating Elementary School Students' Perceptions about Environment through Their Drawings. *Educational Sciences, Theory and Practice*, 12(2), 1132-1139.
- Ozsoy, S., & Ahi, B. (2014). Elementary School Students' Perceptions of the Future Environment through Artwork. *Educational Sciences: Theory and Practice*, 14(4), 1570-1582.
- Palmer, J. (1998). *Environmental Education in the 21st Century: Theory, Practice, Progress and Promise* . New York: Routledge.

- Passmore, J. (1974). *Man's responsibility for nature. Ecological Problems and Western Traditions*. Duckworth, London.
- Patton, M. (2002). *Qualitative Research and Evaluation Methods*. Thousand Oaks, California: SAGE Publications.
- Patton, M. (2014). *Qualitative Research and Evaluation Methods: Integrating Theory and Practice* (4th ed.). Thousand Oaks, California, United States of America : SAGE Publications, Inc.
- Perrin, J. (2018). Recognizing connection to nature: Perspectives from the field. *Applied Environmental Education and Communication*, 17(1), 3-13. <https://doi.org/10.1080/1533015X.2017.1348271>
- Piaget, J. (1951). *The Child's Conception of the World*. Maryland, Rowman and Littlefield Publishers Inc.
- Pointon, P. (2014). "The city snuffs out nature": young people's conceptions of and relationship with nature. *Environmental Education Research*, 20(6), 776-794. <https://doi.org/10.1080/13504622.2013.833595>
- Pyle, R. M. (2002). Eden in a Vacant Lot: Special Places, Species, and Kids in Neighborhood of Life. In P. Kahn, & S. Kellert (Eds.), *Children and Nature: Psychological, Sociocultural and Evolutionary Investigations* (pp. 305-325). Massachusetts: The MIT Press.
- Rejeski, D. (1982). Children Look at Nature: Environmental Perception and Education. *The Journal of Environmental Education*, 13(4), 27-40. <http://dx.doi.org/10.1080/00958964.1982.9942653>
- Rios, C., & Menezes, I. (2017). 'I saw a magical garden with flowers that people could not damage!': children's visions of nature and of learning about nature in and out of school. *Environmental Education Research*, 1402-1413. <https://doi.org/10.1080/13504622.2017.1325450>

- Rolston , H. (1981). Values in Nature. *Environmental Ethics*, 3(2), 113-129.
<https://doi.org/10.5840/enviroethics19813245>
- Rousseau, S., & Deschacht, N. (2020). Public Awareness of Nature and the Environment During the COVID-19 Crisis. *Environmental and Resource Economics*, 1149-1159. <https://doi.org/10.1007/s10640-020-00445-w>
- Sadık, F., Çakan, H., & Artut, K. (2011). Analysis of the Environmental Problems Pictures of Children from Different Socio-Economical Level. *Elementary Education Online*, 10(3), 1066-1080.
- Saldaña, J. (2013). *The Coding Manual for Qualitative Researchers*. London: SAGE Publications.
- Samuelsson, K., Barthel, S., Colding, J., Macassa, G., & Giusti, M. (2020). Urban nature as a source of resilience during social distancing amidst the coronavirus pandemic. *Lands Urban Plan.*
<https://doi.org/10.31219/osf.io/3wx5a>
- Sanaddon, J., Turner, E., & Foster, W. (2008). Children's perceptions of rainforest biodiversity: Which animals have the lion's share of environmental awareness? *PlosOne*, 3(7), 1-5.
<https://doi.org/10.1371/journal.pone.0002579>
- Schreier, M. (2012). *Qualitative Content Analysis in Practice*. London: SAGE Publications.
- Schultz, P. (2002). Inclusion with Nature: The Psychology of Human-Nature Relations. In P. Schmuck (Eds.), *Psychology of Sustainable Development* (pp. 61-78). Kluwer Academic Publishers.
- Schwartz, S. H. (2012). An Overview of the Schwartz Theory of Basic Values. *Online Readings in Psychology and Culture*, 2(1), 3-20.
<https://doi.org/10.9707/2307-0919.1116>

- Serafini, G., Parmigiani, B., Amerio, A., & Aguglia, A. (2020). The psychological impact of COVID-19 on the mental health in the general population. *An International Journal of Medicine*, 113(8), 531-537. <https://doi.org/10.1093/qjmed/hcaa201>
- Shepardson, D. (2005). Students Ideas: What is Environment? *Journal of Environmental Education*, 36(4), 49-58.
- Singh, S., Roy, D., Sinha, K., Parveen, S., Sharma, G., & Joshi, G. (2020). Impact of COVID-19 and lockdown on mental health of children and adolescents: A narrative review with recommendations. *Psychiatry Research*, 293, 1-10. <https://doi.org/10.1016/j.psychres.2020.113429>
- Sjöblom, P., & Wolff, L.-A. (2017). "It wouldn't be the same without nature"—The value of nature according to Finnish upper secondary school students. *The Journal of Environmental Education*, 0(0), 1-12. <http://dx.doi.org/10.1080/00958964.2017.1367637>
- Soga, M., Yamanoi, T., Tsuchiya, K., Koyanagi, T., & Kanai, T. (2018). What are the drivers of and barriers to children's direct experiences of nature? *Landscape and Urban Planning*, 180, 114-120. <https://doi.org/10.1016/j.landurbplan.2018.08.015>
- Stake, R. (1994). Handbook of Qualitative Research. In N. Denzin, & Y. Lincoln (Eds.), *Case Studies*. Thousand Oaks, California: SAGE Publications.
- Stern, P., Dietz, T., Abel, T., Guagnano, G., & Kalof, L. (1999). A Value-belief-norm Theory of Support for Social Movement: The case of environmentalism. *Human Ecology Review*, 6(2), 81-97.
- Stern, P., & Dietz, T. (1994). The Value Basis of Environmental Concern. *Journal of Social Issues*, 50(3), 65-84. <https://doi.org/10.1111/j.1540-4560.1994.tb02420.x>

- Stokas, D., Streou, E., Malandrakis, G., & Papadopoulou, P. (2017). Greek primary school children's representations of the urban environment as seen through their drawings. *Environmental Education Research*, 23(8), 1088-1114. <https://doi.org/10.1080/13504622.2016.1219316>
- Strasburger, V., Wilson, B., & Jordan, A. (2014). Educational and Prosocial Media. In V. C. Strasburger, B. J. Wilson, & A. B. Jordan (Eds.), *Children, Adolescents and the Media* (pp. 121-156). SAGE Publications.
- Sullivan, J. (2012). "Skype: An Appropriate Method of Data Collection for Qualitative Interviews? *The Hilltop Review*, 6(1), 54-60.
- Tarrant, M. (2009). Influence of the Dominant Social Paradigm on Consumer Environmental Attitudes, Values and Behaviors. [Doctoral dissertation, University of Georgia]. https://getd.libs.uga.edu/pdfs/lewis_burt_r_200905_phd.pdf
- Thompson, S., & Barton, M. (1994). Ecocentric and anthropocentric attitudes toward the environment. *Journal of Environmental Psychology*, 14(2), 149-157. [https://doi.org/10.1016/S0272-4944\(05\)80168-9](https://doi.org/10.1016/S0272-4944(05)80168-9)
- United Nations, D., & World Urbanization Prospects 2018. (2018). *2018 Revision of World Urbanization Prospects: 68% of the world population projected to live in urban areas by 2050, says UN*. 2020 tarihinde United Nations: <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html#:~:text=News-,68%25%20of%20the%20world%20population%20projected%20to%20live%20in,areas%20by%202050%2C%20says%20UN&text=Today%2C%2055%25%20of%20the%20>
- Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing and Health Sciences*, 398-405. <https://doi.org/10.1111/nhs.12048>

- van den Berg, A. (1999). *Individual Differences in the Aesthetic Evaluation of Natural Landscapes*. Groningen.
- van den Born, R. (2007). Thinking nature-Everyday philosophy of nature in the Netherlands. [Doctoral dissertation, Radboud University].
- van den Born, R. (2008). Rethinking Nature: Public Visions in the Netherlands. *Environmental Values*, 17(1), 83-109.
<https://doi.org/10.3197/096327108X271969>
- van den Born, R. J., Lenders, R. H., De Groot, W. T., & Huijsman, E. (2001). The new biophilia: an exploration of visions of nature in Western countries. *Environmental Conservation*, 28(1), 65-75.
<https://doi.org/10.1017/S0376892901000066>
- van den Born, R., & de Groot, W. (2009). The Authenticity of Nature: An Exploration of Lay People's Interpretations in the Netherlands. In M.A. Drenthen, F.W.J. Keulartz, J. Proctor. (Eds.), *New Visions of Nature* (pp. 47-66). Springer .
- Vygotsky, L. (1971). *The psychology of art*. Cambridge: MIT Press.
- Wals, A. E. (1994). Nobody Planted It, It Just Grew! Young Adolescents' Perceptions and Experiences of Nature in the Context of Urban Environmental Education. *Children's Environments*, 11(3), 1-27.
- Wilson, E. (1984). *Biophilia*. Harvard University Press.
- WWF. (2020). *The Loss of Nature and The Rise of Pandemics*. Switzerland: WWF International.
https://wwfint.awsassets.panda.org/downloads/the_loss_of_nature_and_rise_of_pandemics___protecting_human_and_planetary_health.pdf
- WWF. (2020a). *Living Planet Report 2020: Bending the Curve of Biodiversity Loss*. WWF International.

<https://f.hubspotusercontent20.net/hubfs/4783129/LPR/PDFs/ENGLISH-FULL.pdf>

- WWF. (2021). *Deforestation Fronts: Drivers and Responses in a Changing World*. WWF International. https://c402277.ssl.cf1.rackcdn.com/publications/1420/files/original/Deforestation_fronts_-_drivers_and_responses_in_a_changing_world_-_full_report_%281%29.pdf?1610810475
- Wylie, J., Sheehy, N., McGuinness, C., & Orchard, G. (1998). Children's Thinking about Air Pollution: a systems theory analysis. *Environmental Education Research*, 4(2), 117-137. <https://doi.org/10.1080/1350462980040201>
- Xu, Z., & Bengston, D. (1997). Trends in national forest values among forestry professionals, environmentalists and the news media, 1982-1993. *Society and Natural Resources*, 10(1), 43-59.
- Yardımcı, E., & Kılıç, G. (2010). Children's views of environment and environmental problems. *Elementary Education Online*, 9(3), 1122-1136.
- Yin, R. (2011). *Qualitative Research from Start to Finish*. New York, United States of America: The Guilford Press.
- Yin, R. (2018). *Case Study Research and Applications: Design and Methods* (6th ed.). Thousand Oaks, California: SAGE.
- Yoshida, Y., Flint, C., & Dolan, M. (2018). Farming between love and money: US Midwestern farmers' human-nature relationships and impacts on watershed conservation. *Journal of Environmental Planning and Management*, 61(5-6), 1033-1050. <https://doi.org/10.1080/09640568.2017.1327423>
- Zweers, W. (1989). Grondhoudingen ten opzichte van de natuur. *Heidemijtijdschrift*, 74-80.
- Zweers, W. (2000). *Participating in nature-Outline for an ecologization of our world view*. Utrecht: J. Taylor Trans.



APPENDICES

A. Cards for Human-Nature Relationship Types

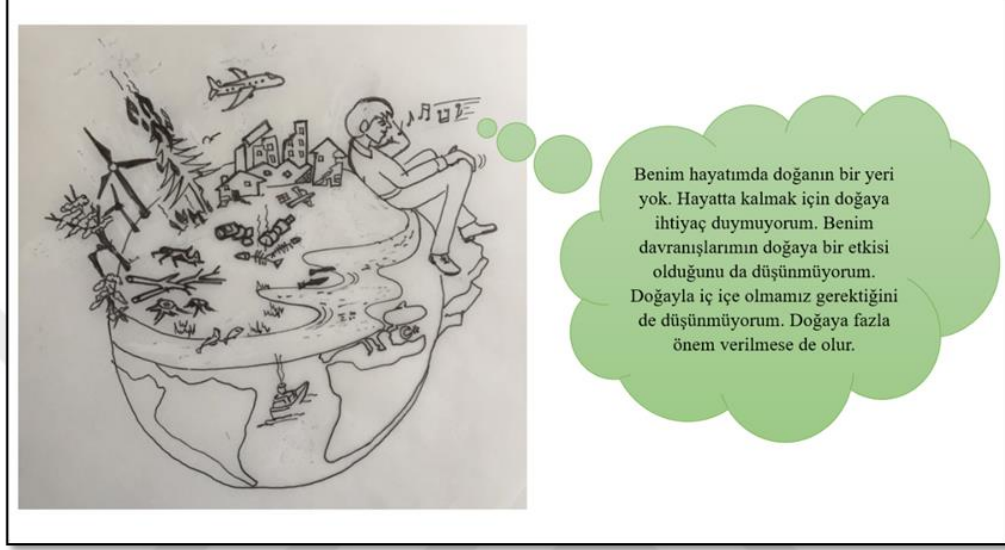


Figure 6-1 Card of Apathy Type



Figure 6-2 Card of Participant Type

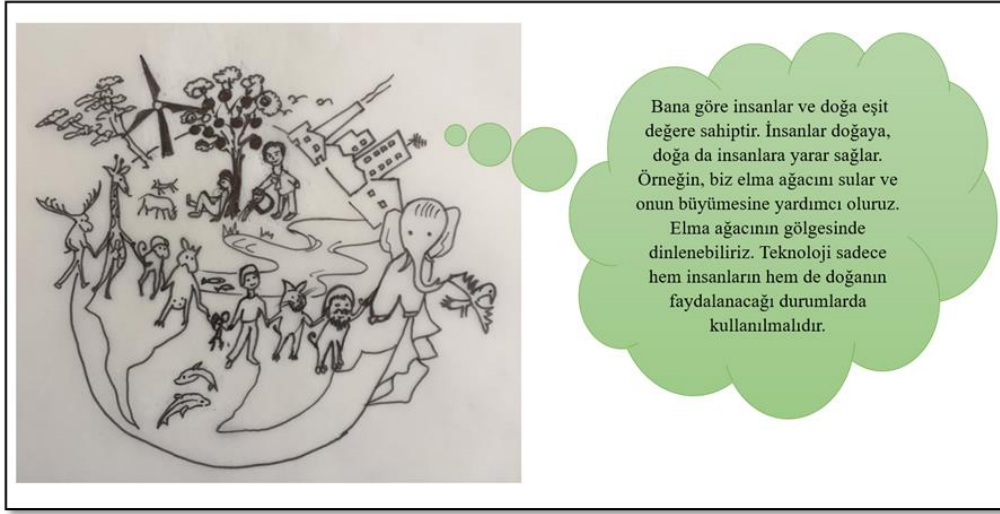


Figure 6-3 Card of Partner Type



Figure 6-4 Card of Steward Type

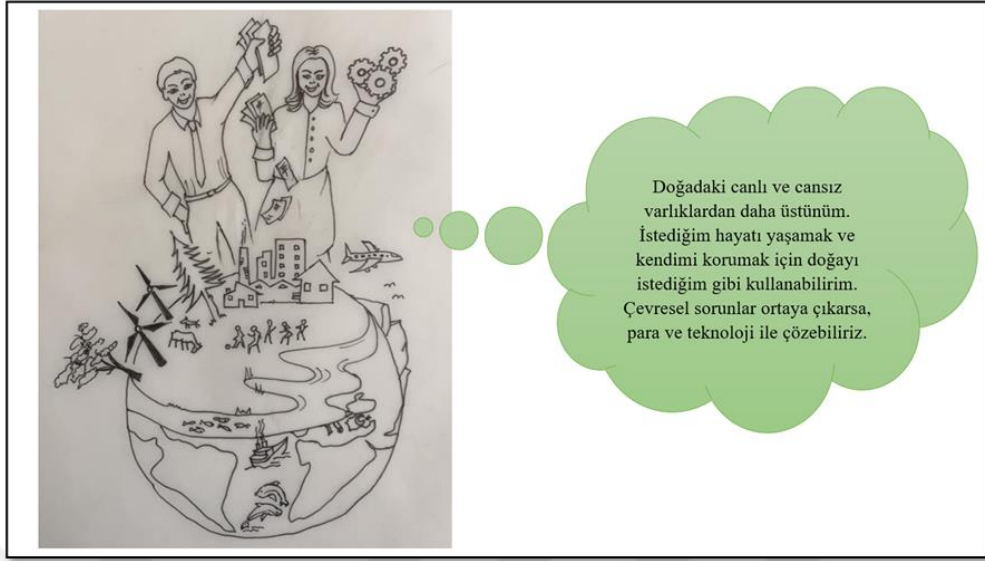


Figure 6-5 Card of Master Type



Figure 6-6 Card of Nature Distant Guardian Type

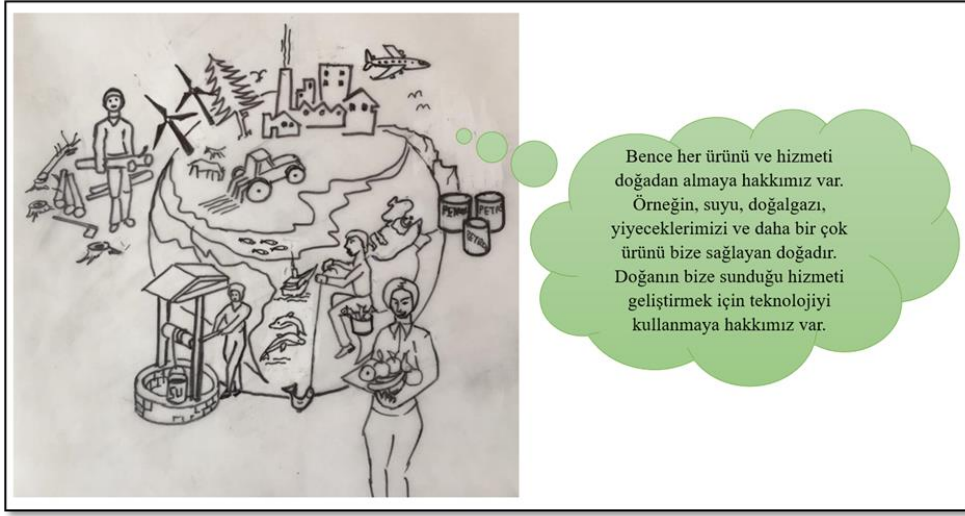


Figure 6-7 Card of User Type

B. Turkish Version of Semi-Structured Interview Protocol

Interview Protocol

Opening Script

Ben bir öğretmenim, senin doğa ve insanın etkileşimi ile ilgili görüşlerini merak ediyorum. Bunun için seninle kısa bir sohbet etmek istiyorum.

Demographic Questions

- Kaç yaşındasın?
- Nerede oturuyorsun?
- Annenin mesleği nedir?
- Annen en son hangi okuldan mezun oldu?
 - Ortaokul, Lise, Üniversite?
- Babanın mesleği nedir?
- Baban en son hangi okuldan mezun oldu?
 - Ortaokul, Lise, Üniversite?
- Boş vakitlerini nasıl geçiriyorsun?
- Doğada bulunmak deyince ne anlarsın?
- Daha önce doğayla iç içe geçirdiğin zamanlar varsa bunları benimle paylaşır mısın?
- Doğada bulunmak sana ne hissettiriyor? Ne tür duygular beslersin doğaya yönelik?

Part-1: Nature Perceptions of Students with Guided Imagery Task

Hadi oturduğumuz yerden, kafamızın içinde bir doğa gezintisine çıkalım seninle. Bunun için gözlerimizi kapayalım. Kendini hangi pozisyonda rahat hissedersen o şekilde durabilirsin. Eğer istersen, ellerini karnının üstüne koyup yumuşak bir şekilde onu bir balon gibi şişirip indirebilirsin. Evet, şimdi, nefes alıp, verelim, rahatlayalım... Şimdi, kendini dışarıda/doğada bir şeyler yaparken hayal etmeni istiyorum. Burası önceden gittiğin, gitmek istediğin ya da tamamen hayal gücünle oluşturduğun bir yer olabilir. Derin nefes al ver, rahatla ve düşün... (Öğrenciye hayal etmesi için bir miktar zaman verilir.)

Şimdi nasıl bir yer hayal ettiğine dair konuşmak istiyorum seninle.

1. Hayal ettiğin yerde hangi varlıklar var, neler gördüğünü detaylıca bana anlatabilir misin?
2. Kulağına bazı sesler geliyor mu?
3. Nasıl kokular alıyorsun?
4. Havanın durumu nasıl? Sıcak mı soğuk mu? Nasıl bir ortam var?
5. Sen kendini de o hayalin içine koydun mu?
6. Peki, sen orada ne yapıyorsun?
7. Hayal ettiğin yerde sen kendini nasıl hissediyorsun?
8. Başkaları da var mı hayalinin içinde?
 - a. Var ise, o kişiler kimler ve ne yapıyorlar?
 - b. Yok ise, neden yalnız kalmayı tercih ettin?
9. Hayal ettiğin yerdeki bu varlıklar birbiriyle nasıl ilişkili sence?
10. Doğada gezinti deyince aklına neden böyle bir yer hayal etmek geldi?
 - a. Öncesinde gittiğin bir yer mi?
 - b. Var olan ama senin gitmediğin ve gitmek istediğin bir yer mi?
 - c. Yoksa tamamen hayalinde oluşturduğun bir yer mi?
11. Hayal ettiğin yerde seni rahatsız eden/endişelendiren bir durum, birileri vs. var mı? Varsa nedir? Ve bunun seni rahatsız etme/endişelendirme nedeni ne? (Eğer öğrenci hali hazırda hayalinden rahatsız olduğu şeylerden bahsediyorsa, bu soru sorulmadan doğrudan neden bu şey seni rahatsız etti/endişelendirdi? sorusu sorulur.)

Şimdi gözlerimizi açalım. Ellerimizi kollarımızı ayaklarımızı esnetelim, gerinelim. Rahatladık mı?

Part-2: Perceptions of Students on Human-Nature Relationship with Drawing Task

Şimdi hayali yolculuğumuzdan, gerçek hayata döndük. Gerçek yaşamda doğa ve insan arasında neler oluyor senden onu öğrenmek istiyorum. Bu yüzden bu konuda seninle biraz sohbet edelim.

Ama önce seninle küçük bir etkinlik yapacağız. Buradaki kalemler ile kağıda çizim yapmanı isteyeceğim.

12. İnsanların doğayla nasıl bir etkileşim içinde olduğunu çizer misin?
13. Bu çizimini bana anlatabilir misin?
 - a. Nasıl öğeler var? (Anlaşılmayan öğeler further questionlar ile tek tek sorgulanabilir.)
 - b. İnsanlar doğaya nasıl davranıyorlar?
14. Kendini gördüğün yeri çiziminde işaretleyerek gösterir misin? (Çiziminde kendisini zaten çizip bahsettiyse bunu sormaya gerek yok.) Çizdiysen kendini nasıl çizdin?
15. Peki, çizdiklerin arasında nasıl etkileşimler var sence, örnek vererek açıklayabilir misin? İstersen çizimlerinin arasına etkileşimleri gösteren oklar da koyabilirsin.

Part 3: Perceptions of Students on Human-Nature Relationship with Picture Selection Task

HNR tipolojisinde seçilen tiplerin resimleri öğrencilere gösterilir.

16. Sana göre insanlar ve doğa arasındaki ilişkiyi en iyi yansıtan resim hangisi? Neden?
17. Resimleri inceledin. Karakterleri ve düşünce baloncuklarının içindeki yazıları okudun. Peki, sen kendini hangi karaktere daha yakın görüyorsun?

Closing Script

Sohbetimiz ve etkinliklerimiz bu kadardı. Teşekkür ederim. Senin bana sormak istediğin veya eklemek istediğin bir şey var mı?

C. Permission from The Ethical Committee at METU

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER



ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

DUMLUPINAR BULVARI 06800
ÇANKAYA ANKARA/TURKEY
Sayı: 28620816 / 5ul
T. +90 312 210 79 59
ueam@metu.edu.tr
www.ueam.metu.edu.tr

02 Ocak 2020

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Doç.Dr. Elvan ŞAHİN

Danışmanlığını yaptığınız Ceren BAŞER'in "Ortaokul Öğrencilerinin Doğa ve İnsan-Doğa İlişisine Yönelik Algılarının İncelenmesi" başlıklı araştırması İnsan Araştırmaları Etik Kurulu tarafından uygun görülmüş ve 518 ODTU 2019 protokol numarası ile onaylanmıştır.

Saygılarımızla bilgilerinize sunarız


Doç.Dr. Mine MISIRLISOY
Başkan

Prof. Dr. Tolga CAN

Üye

Doç.Dr. Pınar KAYGAN

Üye

Dr. Öğr. Üyesi Ali Emre TURGUT

Üye

Dr. Öğr. Üyesi Şerife SEVİNÇ

Üye

Dr. Öğr. Üyesi Müge GÜNDÜZ

Üye

Dr. Öğr. Üyesi Süreyya Özcan KABASAKAL

Üye

D. Permission from The Ministry of National Education



T.C.
ANKARA VALİLİĞİ
Milli Eğitim Müdürlüğü

Sayı : 14588481-605.99-E.4007316
Konu : Araştırma İzni

24.02.2020

ORTA DOĞU TEKNİK ÜNİVERSİTESİNE
(Öğrenci İşleri Daire Başkanlığı)

İlgi : a) 05.02.2020 tarihli ve 179 sayılı yazınız.
b) MEB Yenilik ve Eğitim Teknolojileri Genel Müdürlüğünün 2017/25 nolu Genelgesi.

Üniversiteniz Matematik ve Fen Bilimleri Eğitimi Anabilim Dalı yüksek lisans programı öğrencisi Ceren BAŞER'ın "Ortaokul Öğrencilerinin Doğa ve İnsan-Doğa İlişkisine Yönelik Algılarının İncelenmesi" konulu çalışması kapsamında ilimiz Çankaya, Yenimahalle İlçelerine bağlı, ekli listedeki okullarda uygulama talebi ilgi (b) Genelge çerçevesinde incelenmiştir.

Yapılan inceleme sonucunda, söz konusu araştırmanın Müdürlüğümüzde muhafaza edilen ölçme araçlarının; Türkiye Cumhuriyeti Anayasası, Milli Eğitim Temel Kanunu ile Türk Milli Eğitiminin genel amaçlarına uygun olarak, ilgili yasal düzenlemelerde belirtilen ilke, esas ve amaçlara aykırılık teşkil etmeyecek, eğitim-öğretim faaliyetlerini aksatmayacak şekilde okul ve kurum yöneticilerinin sorumluluğunda gönüllülük esasına göre uygulanması Müdürlüğümüzce uygun görülmüştür.

Bilgilerinizi ve gereğini rica ederim.

Turan AKPINAR
Vali a.
Milli Eğitim Müdürü

Dağıtım
Gereği:
Orta Doğu Teknik Üniversitesi

Bilgi:
Çankaya, Yenimahalle İlçe MEM

Adres: Emniyet Mah. Alparslan Türkeş Cad. 4/A
Yenimahalle/ANKARA
Elektronik Ad: www.meb.gov.tr
e-posta: istanbul06@meb.gov.tr

Bilgi için: D. KARAGÜZEL
Tel: 0 (312) 306 39 07
Faks: 0 ()

Bu evrak güvenli elektronik imza ile imzalanmıştır. <http://evrak.meb.gov.tr> adresinden afd4-7320-37db-a8f9-3d90 kodu ile teyit edilebilir.

E. Turkish Summary / Türkçe Özet

Ortaokul Öğrencilerinin Doğa Vizyonları Üzerine Bir Vaka Çalışması

GİRİŞ

Dünya'nın sanayileşmesi, hızla gelişen teknoloji ve kentleşme nedeniyle her bakımdan doğayla iç içe olan insanoğlunun doğaya yabancılaşıp uzaklaştığı gözlemlenmektedir. İnsanlar daha rahat bir yaşam tarzına sahip olabilmek adına doğayı dönüştürmüş, kullanmış ve doğaya karşı ilgileri giderek azalmıştır (Schultz, 2002). Zaman içinde, insanların kendi çıkarları için doğa üzerinde bıraktıkları etkiler, doğal dengeyi bozmuş ve biyoçeşitliliğin azalması, buzulların erimesi, hava kirliliğinin artması gibi yıkıcı sonuçlara yol açmıştır. Bir bakıma yaşadığımız gezegen bize tehlike çanları çalarak uyarı vermiştir ve vermeye devam etmektedir (World Wildlife Fund, 2020a). İnsan faaliyetlerinin etkileri yalnızca doğa üzerinde gözükmemekle birlikte, doğal dengenin bozulması insanların da sağlığını etkileyecek boyutlara ulaşmaktadır (WWF, 2020a). İnsan ve doğa arasındaki ilişki çarpıcı ve somut örneklerle göz önünde olmasına rağmen, insanların doğaya karşı olan umursamaz tutumları ve üstün tavırları varolan problemlerin artarak devam etmesine neden olmaktadır.

Dünya nüfusundaki artış, hızlı şehirleşme, doğal kaynak kullanımına karşı artan talep nedeniyle doğal ortamlar yok olmuş veya bozulmuştur. Dolayısıyla, günümüzdeki çocuklar sağlıklı bir doğal ortamda deneyim edinme, zaman geçirme şanslarını yeterince elde edememektedirler (Louv, 2018). Dahası, gelişen teknoloji ve şehirde yaşamın getirdiği hayat tarzı çocukları da doğaya karşı yabancılaştırmıştır (Heerwagen & Orians, 2002). Bu durum karşısında uzmanlar, Louv'un (2018) belirttiği 'Doğa Yoksunluğu Sendromu'nun çağımız çocukları üzerinde sorun teşkil

edecek konuma gelmesinden, gelecek nesillerin doğayla iletişim halinde olmamasından ve bunun tüm canlılar ve gezegenimiz için tehlike arz etmesinden endişe duymaktadır.

Uzmanlar, çocukların karşı karşıya olduğu doğa yoksunluğu durumuyla ilgili endişelerinde haklıdırlar çünkü, Kellert'a (2002) göre, doğayla çocukların arasındaki etkileşim, ortaokul öğrencilerinin bilişsel, duygusal, değerlendirmeye yönelik gelişimlerini sağlamaktadır. Ayrıca, doğa ve insan arasındaki artan etkileşimlerin, doğada zaman geçirmenin, doğaya karşı davranışları pozitif açıdan etkilediği görülmüştür (Kellert, 2002). Bu bağlamda, Fen Bilimleri Öğretim Programı'nın da amaçları arasında olan doğaya karşı bilinçli ve çevresel problemler hakkında farkındalığı olan çocuklar yetiştirmek için öncelikle öğrencilerin doğaya karşı bakış açılarını öğrenmek önem arz etmektedir.

Bunun yanı sıra, insanların doğa ile olan ilişkisi ile doğaya karşı bakış açıları ayrılması zor, iç içe geçen görüşlerdir (Flint ve diğerleri, 2013). İnsan ve doğa arasındaki ilişkinin düzgün bir şekilde kurulması, öğrencilerin yalnızca fiziksel ve ruhsal açıdan gelişmesine değil, aynı zamanda karakter gelişimi ve bilişsel gelişimi için de önemli görülmektedir (Pointon, 2014; Kahn ve diğerleri, 2009; Kellert, 2002). Bugünün çocukları yarının yetişkinleri olarak gelecek yıllardaki çevresel problemlerin önüne geçmek veya varolan problemlere çözümler bulmak durumunda kalacaklardır (National Wildlife Federation, 2015; Hughes, Richardson, & Lumber, 2018). Bu nedenle, öğrencilerin doğa ve insan ilişkileri hakkındaki görüşleri incelenmeli, bu ilişkiler incelenirken öğrencilerin doğaya karşı bakış açıları da göz önünde bulundurulmalıdır (Flint ve diğerleri, 2013). Bu ilişki ve görüşlere yönelik bağlantılar ise eğitim programlarında vurgulanmalıdır. Öğrencilerden elde edilen görüşler sayesinde eğitim programlarına, çocukların doğaya karşı ilgilerini arttıracak, farkındalıklarını geliştirecek, doğayla olan ilişkilerini sağlamlaştıracak eklemeler yapılabilir. Tüm bu sebeplerden kaynaklı olarak, öğrencilerin doğayı neden önemli gördükleri bu çalışma kapsamına dahil edilmiştir. Özetle, 'Doğa Vizyonları' çerçevesinde, öğrencilerin doğaya karşı bakış açıları, insan-doğa

arasındaki ilişkiye yönelik bakış açıları ve doğaya verdikleri değer üç ana başlık altında incelenecektir.

Birden fazla disiplinde çalışılan, kapsayıcı bir terminoloji olan ‘Doğa Vizyonları’ kuramsal çerçevesi; doğa imgeleri, insan-doğa ilişkisi imgeleri ve doğa değerleri olmak üzere üç ana ögeden oluşmaktadır. İlgili alanyazını incelendiğinde, doğa vizyonları kapsamında yapılan çalışmalar genel olarak Hollandalı araştırmacılar tarafından çoğunlukla yetişkin katılımcılarla çalışılarak yürütülmüştür. Bu nedenle, çalışmada doğa vizyonları çerçevesinin odak noktalarını daha iyi aktarabilmek adına yapılan çalışmalar yetişkinlerle (Braito ve diğerleri, 2017; Duong & van den Born, 2019; Kloek ve diğerleri, 2017) ve öğrencilerle (Hallås & Heggen, 2018; Li & Ernst, 2015; Sjöblom & Wolff, 2017) yapılan çalışmalar olarak iki ayrı başlık altında sunulmuştur. Yetişkinlerin doğa vizyonlarının incelendiği çalışmalarda üç öge birden incelenmiş, doğa imgeleri başlığı altında çıkan sonuçlarda insanların doğayı çoğunlukla yeşil, açık alanlar olarak gördüğü tespit edilmiştir (Bujis, 2009; Bujis ve diğerleri, 2009; Kloek ve diğerleri, 2017). Araştırmacılar halktan insanların doğaya karşı görüşlerini farklı kategoriler altında, vahşi doğa, kırsal doğa, evcilleştirilen doğa, etkili doğa, yararlı doğa ve yağmur ormanları olarak isimlendirmiştir. Bu kategorilerin dağılımı farklı çalışmalarda farklı önem sırasındadır. Öğrencilerin doğa imgeleri hakkında yapılan araştırmalarda da (Adam & Savahl, 2015; Collado ve diğerleri, 2016; Pointon 2014; Rios & Menezes, 2017), yetişkinlerden çok farklı olmaksızın doğa dediğimizde akıllarına orman, yeşil alan, hayvanlar ve bitkiler geldiğinden bahsedilmiştir.

Doğaya verilen değer hakkında yukarıda bahsedilen çalışmalarda, insanların çoğunluğunun doğayı önemli olarak gördüğü belirlenmiştir. Öte yandan, insanlar doğaya verdikleri değer ve önemin nedenini çeşitli açılardan yaklaşılarak belirtmiştir. Kimisi insanlar için olan faydasından bağımsız olarak doğanın kendi değeri olduğunu ve bu nedenle önemli olduğunu belirtirken, kimisi doğal kaynaklar sayesinde insanların hayatta kalabildiğinden, insanların doğa olmadan yaşamlarını sürdüremeyeceğinden ve sağlık, eğlence, gelecek nesiller için önemli olduğundan bahsetmiştir.

Üçüncü öge olarak insanların doğa ile olan ilişkisini ele alan çalışmalarda, insan-doğa arasında olması gereken düzgün ilişkiyi, diğer deyişle kendi bakış açılarını tanımlarken genelde alanyazınında bahsedilen tiplerden Koruyucu, Ortak ve Katılımcı tiplerine daha yakın oldukları ve Kontrolcü/Efendi ve Umursamaz tiplerini doğru bulmadıkları anlaşılmıştır. Lakin, halktan kişilere diğer insanların doğa ile arasındaki ilişkinin nasıl olduğu sorulduğunda bir önceki fikirlerinin aksine, diğer insanların doğa olan ilişkilerini Kontrolcü/Efendi ve Umursamaz tipleriyle betimlemişlerdir (Braitto ve diğerleri, 2017). Bu bulgulara benzer bir çok çalışma yapılmasına rağmen öğrencilerle yapılan çalışmalar alanyazınında eksik kalmıştır ve doğrudan van den Born ve arkadaşlarının (2001) önerdiği ‘Doğa Vizyonları’ çerçevesi altında üç ögeyi de içeren kapsayıcı bir çalışmaya eğitim alanında denk gelinmemiştir. Çevre eğitimi kapsamındaki hedefler doğrultusunda çevreye karşı tutumun daha olumlu hale getirilmesi adına ve ilgili alanyazınına kapsayıcı bir çalışma ile katkıda bulunabilmek adına, bu çalışma Türkiye’de yaşayan ortaokul öğrencileriyle gerçekleştirilmiştir.

Çalışmanın Amacı ve Araştırma Soruları

Bu çalışmanın amacı, ‘Doğa Vizyonları’ başlığı altında ortaokul öğrencilerinin doğaya yönelik görüşlerinin, doğaya verdikleri değer ve insan-doğa arasındaki ilişkiye yönelik bakış açılarının araştırılmasıdır. Üçüncü öge olan insan-doğa arasındaki ilişki iki alt başlık altında ‘öğrencilerin ideal insan-doğa ilişkisine yönelik kendi görüşleri’ ve ‘öğrencilerin diğer insanların doğayla ilişkisine yönelik görüşleri’ olarak incelenmiştir. Bu bakış açıları doğa imgeleri, doğanın değeri ve insan-doğa ilişkisi imgeleri başlıkları altında incelenmiştir. Bu amaç doğrultusunda belirtilen araştırma soruları aşağıdaki gibidir.

1. Ortaokul öğrencilerinin ‘Doğa Vizyonları’ nelerdir?
 - 1.1. Ortaokul öğrencileri doğayı nasıl görmektedir?
 - 1.2. Ortaokul öğrencileri doğaya nasıl değer vermektedir?

1.3. Ortaokul öğrencilerinin insan-doğa arasındaki etkileşime ilişkin görüşleri nelerdir?

1.3.1. Ortaokul öğrencilerinin insan-doğa ilişkisine yönelik kendi fikirleri nasıldır?

1.3.2. Ortaokul öğrencileri diğer insanların doğa ile olan ilişkilerini nasıl görmektedir?

Çalışmanın Önemi

Günümüz toplumlarında, çevreci ve doğayı koruyan kişiler ve kuruluşlar doğanın korunmasının uzun süreye yayıldığını ve bütün halkın sorumluluk almasıyla başılabileceğine inanmaktadır (Kloek ve diğerleri, 2017). Ayrıca, sosyal ve fen bilimlerinde çalışma yapan araştırmacılar, ancak insanların doğayı ve doğayla aralarındaki ilişkinin nasıl olduğu anlaşıldığında anlamlı ve tesiri olan çözümler ve uygulamalar geliştirilebileceğini söylemektedir (Bennett ve diğerleri, 2016; Kloek ve diğerleri, 2017). Bunlar göz önüne alındığında, doğaya karşı bakış açıları ve insan-doğa arasındaki ilişkiler günümüzde ülkelerin eğitim sistemlerinde yer almaya başlamıştır. Ne var ki, kişilerin doğaya karşı bakış açıları, doğaya verdikleri değer ve doğayla olan ilişkileri gittikçe önem kazansa da, halen gerek Dünya, gerekse Türkiye alanyazınında bu konuyla ilgili kapsamlı çalışmalarda eksiklik olduğu gözlemlenmektedir (Ozsoy & Ahi, 2014; Kalvaitis & Monhardt, 2012, Jordan & Kristjansson, 2017; Kalvaitis & Monhardt, 2012; Nevers ve diğerleri, 2006). Aynı zamanda, öğrenciler eğitim sisteminin en önemli parçalarından biri olmalarına rağmen, çevreye yönelik tutumlar, çevre bilgisi, çevre okuryazarlığı gibi konular yapılan diğer çalışmalarla kıyaslandığında öğrencilerin doğa ve insan-doğa ilişkisi görüşleri üzerine yapılan çalışmaların az olduğu öne sürülmüştür (Ozsoy, 2012; Ozsoy & Ahi, 2014; Gunindi, 2012; Ardoin ve diğerleri, 2012). Araştırmacılar, doğa görüşleri, doğanın değeri ve insan-doğa arasındaki ilişki gibi konuların çevre eğitimi için temel meseleler olduğu için araştırılmasının önemini vurgulamışlardır (Korfiatis ve diğerleri, 2004; Palmer, 1998; Wals, 1994). Bu nedenle, hem doğaya karşı görüşleri, hem doğaya verilen değeri hem de insan-doğa ilişkisini bir arada,

öğrencilerin görüşlerini çeşitli yöntemler kullanarak araştıran bu çalışmanın alanyazınındaki mevcut eksikliklerin onarılmasına katkı sağlayacağı düşünülmektedir. Bunun yanı sıra, doğaya karşı sahip olunan bakış açılarının insanların davranışları üzerine etkisi olduğu belirtilmektedir (Braitto ve diğerleri, 2017). Bu açıdan değerlendirildiğinde, gelecek nesillerin daha sürdürülebilir bir dünya yaratabilecek davranışlar sergileyebilmesi adına, şimdiden öğrencilerin davranışlarını etkileyen görüşlerini ve değer yargılarını öğrenmenin sürdürülebilirlik için önemli olduğu söylenmektedir (Hallås & Heggen, 2018).

Öte yandan, Colucci-Gray ve arkadaşları (2006) belirtmiştir ki, öğrencileri çevresel bir konu hakkındaki görüşlerini ve değerlerini düşünmeye yönlendirmek, onları daha mantıklı, kapsamlı ve çevrelerine yararlı olacak kararlar alan bireyler haline getirmektedir. Ayrıca, çevre eğitimi kapsamında öğrencilerin dünya görüşlerinin, inançlarının ve değer yargılarının bireylerin tipolojileriyle ilişkilendirilerek yapılan çalışmaların eksik olduğu belirtilmiştir (Ardoin ve diğerleri, 2013, p. 501). Bu bakımdan, çalışmada ‘Doğa Vizyonları’ gibi kapsamlı, belirtilen üç elementi de barındıran ve öğrencilerin doğa görüşlerini, doğaya verdikleri değeri ve tipolojilerinin belirlenmesini sağlayan bir çerçeve kullanılması, çalışmaya değer katmaktadır.

Ek olarak, insanların doğa ile olan ilişkilerinin sürdürülebilir kalkınma hedefleri ile ilişkilendirilebileceği belirtilmiştir (akt. Braitto ve diğerleri, 2017). İlgili alanyazında, insan ve doğa ilişkisinin önemli noktalarının sürdürülebilir kalkınma için eğitim kapsamında tam olarak vurgulanmadığı ve insanın doğa içindeki yerinin belirtilmediği söylenerek insan ve doğa arasındaki ilişkinin incelenmesi gerektiği açıkça vurgulanmıştır. Bu nedenle, bu çalışma, sürdürülebilir kalkınma kapsamında insanın doğa içinde nasıl konumlandırıldığını öğrenme imkanı sağlayabilir. Ayrıca, bu konu kapsamında, eğitim programlarında yapılabilecek değişim ve eklemelere dair ışık tutucu bilgiler edinilebilir.

Bu çalışma kapsamında ortaokul öğrencilerinin ‘Doğa Vizyonları’ incelenmiştir. Doğa Vizyonları çerçevesi kapsamında, küçük yaş grubuyla çalışılan ve üç ögesine

birden odaklanılan makalelere rastlanılmamıştır. Öğrencilerle çalışılmış olarak belirtilen makaleler ‘Doğa Vizyonları’ çerçevesinde incelenmemiş, bu çerçevenin öğelerinden birkaçına değinilerek araştırmalar yapılmıştır. Önceden de belirtildiği gibi ‘Doğa Vizyonları’ ile ilgili çalışmalar Hollandalı araştırmacılar tarafından genellikle yetişkin halktan insanlarla yürütülmüştür. Bu çalışmayı farklı kılan özellik, van den Born ve arkadaşlarının (2001) önerdiği Doğa Vizyonları yapısının ve içerdiği üç ögenin birden öğrencilerle çalışılmasıdır.

Yapılan çalışmalara bakıldığında, ‘Doğa Vizyonları’ bağlamında yapılan çalışmalar genelde Batı ülkelerinde yürütülmüştür (Duong & van den Born, 2019; Kloek ve diğerleri, 2017). Özellikle van den Born ve arkadaşlarının (2001) önerdiği çerçevede, insan-doğa ilişkisi tiplerine yönelik çalışmalar genellikle Hollanda, Fransa ve Almanya’da yapılmış, Türkiye’de ise bu konuda yapılan az sayıda çalışma mevcuttur ve Türklerin de içinde olduğu az sayıdaki bu çalışmalar (Duong & van den Born, 2019; Kloek ve diğerleri, 2017) ise yetişkinlerle yürütülmüştür. Bu açıdan bakıldığında, bu çalışma Doğa Vizyonları çerçevesinin Türkiye’de ortaokul öğrencileriyle yürütülmüş olması çalışmayı özgün kılmaktadır.

Çalışmayı önemli kılan bir diğer özellik, çalışma içerisinde yapılan görüşmeler dışında farklı veri toplama yöntemlerinden faydalanılmasıdır. Alanyazındaki nitel çalışmalarda en çok tercih edilen yöntemin bireysel ve grup görüşmeleri olduğu bilinmektedir. Bu çalışmayı önemli kılan nokta, yapılan yarı-yapılandırılmış görüşmeler haricinde güdümlenmiş görsellik, çiz-ve-yaz gibi tekniklerinin ve insan-doğa ilişkilerine yönelik tiplerin öğrencilere daha iyi aktarılacak onları fikir paylaşımına davet etmek amacıyla hazırlanmış görselli kart seçim yönteminin kullanılmasıdır.

YÖNTEM

Araştırma Yöntemi

Bu çalışmada, öğrenci görüşlerinin ‘Doğa Vizyonları’ çerçevesinin üç ana ögesi altında derinlemesine incelenmesi amaçlandığı için nitel araştırma yöntemi uygun

görülmüştür. Öğrencilerin doğaya yönelik görüşlerinin, doğaya verdikleri değerin ve insan-doğa ilişkisi hakkındaki görüşlerinin detaylı bir şekilde analiz edilmesi amaçlanmıştır. Creswell'e (2007) göre vaka çalışması bir ya da birden fazla durumlarda detaylı araştırma yapmak için kullanılmıştır, bu nedenle çalışmada, nitel araştırma yöntemlerinden birisi olan 'vaka çalışması' seçilmiştir.

Katılımcılar

Bu çalışmanın katılımcıları Türkiye'de bir şehir merkezinde ikamet eden ve amaçlı örneklem seçimi ile belirlenmiş 13 ortaokul öğrencisinden oluşmaktadır. Katılımcılar öğrencilerden oluştuğu ve 18 yaşından küçük oldukları için velilerinden gerekli etik izinler alınarak öncesinde velilerle görüşme yapılmıştır. Bu sayede, araştırmacı, veli ve öğrenciye çalışmanın amacı ve veri toplama süreci ile ilgili bilgiler aktarılmış, veri toplama sürecinde öğrencilerin araştırmacıya görüşlerini açıkça ifade edebilmesi hedeflenmiştir.

Veri Toplama Araçları

Çalışmanın verileri, öğrenciler ile birebir yarı-yapılandırılmış görüşmeler aracılığıyla toplanmıştır. Temel veri toplama aracı yarı-yapılandırılmış bireysel görüşmeler iken, güdümlenmiş-görsellik tekniği, çiz-ve-açıkla tekniği ve insan-doğa ilişkisini gösteren tiplerle ilgili bilgileri barındıran kartların seçimi aracı destekleyici veri toplama araçları olarak kullanılmıştır.

Yarı-Yapılandırılmış Görüşmeler

Görüşmeler nitel çalışmanın en önemli veri toplama araçlarından biridir (Creswell, 2007). Merriam (2009) ise görüşmeleri insanların iç dünyalarını derinlemesine anlayabilmemizi sağlayan araçlar olarak görmektedir. Çalışma boyunca öğrencilere yarı-yapılandırılmış görüşme protokolü soruları aktarılmış ve Doğa Vizyonları kapsamında olan üç öge için de (doğa imgeleri, doğanın değeri, insan-doğa ilişkisi imgeleri) detaylı görüşleri öğrenilmeye çalışılmıştır. Yarı-yapılandırılmış görüşme aracının da doğası gereği öğrencilerin verdiği cevaplara göre bazı ek sorular da

yöneltilmiştir. Katılımcılara yöneltilen sorular ve görüşme protokülünün tamamı Ek-B’de görülmektedir.

Güdümlenmiş-Görsellik Tekniği

‘Doğa Vizyonları’ çerçevesinde olan üç ögeyi destekleyici, farklı veri toplama araçları da kullanılmıştır. Bunlardan ilki, öğrencilerin doğaya yönelik görüşlerini daha rahat paylaşabilmelerini sağlamak ve onlar için görüşmeyi daha eğlenceli hale getirebilmek adına uygulanan ‘güdümlenmiş-görsellik tekniği’dir. Öğrencilerden gözlerini kapatıp kendilerini doğada hayal etmeleri istenmiştir. Bu sayede öğrencilerin zihnindeki doğa kavramı ve doğaya karşı bakış açıları ortaya konmaya çalışılacaktır. Veri toplama esnasında öğrencilere ne yapmaları gerektiğini söylenen yönerge aşağıdaki gibidir ve öğrencilere Ek-B’de verilen görüşme soruları sorulmaya devam edilmiştir.

"Hadi oturduğumuz yerden, kafamızın içinde bir doğa gezintisine çıkalım seninle. Bunun için gözlerimizi kapayalım. Kendini hangi pozisyonda rahat hissedersen o şekilde durabilirsin. Eğer istersen, ellerini karnının üstüne koyup yumuşak bir şekilde onu bir balon gibi şişerip indirebilirsin. Evet, şimdi, nefes alıp, verelim, rahatlayalım... Şimdi, kendini dışarıda/doğada bir şeyler yaparken hayal etmeni istiyorum. Burası önceden gittiğin, gitmek istediğin ya da tamamen hayal gücünle oluşturduğun bir yer olabilir. Derin nefes al ver, rahatla ve düşün... (Öğrenciye hayal etmesi için bir miktar zaman verilir.)"

Çiz-ve-Açıkla Tekniği

Çizim tekniği çocukların dış dünyayı nasıl algıladıklarını çizim yaparak dışa yansıtmak için uygun bir teknik olarak görülmektedir (Vygotsky, 1971; Artut, 2002; Ozsoy, 2012). Çocukların görüşleri yaptıkları çizimlerle daha somut bir şekilde anlaşılabilir. Çizim tekniğinin avantajları göz önünde bulundurulduğunda öğrencilere diğer insanların doğayla olan ilişkileri hakkında ne düşündükleri

sorularak bu ilişkiyi resmetmeleri istenmiştir. Veri toplama sürecinde, öğrencilerin çizimleri araştırmacı ile paylaşımları ve çizimlerini anlatmaları istenmiştir.

İnsan-Doğa İlişkisi Tipleri- Kart Seçim Aracı

Kart Seçim aracı insan-doğa arasındaki ilişkiyi yansıtan tipolojilerden oluşmuştur. Öğrencilerden bu kartların üstündeki düşünce balonlarını okuması ve çizilen resimleri incelemeleri istenmiştir. Bu kısımda, görüşme protokolündeki iki farklı soru sorulmuştur: ilki, öğrencilerin insan-doğa ilişkisinin nasıl olması gerektiğine dair görüşlerine ait cevaplar bulmakla ilgili iken; ikincisi öğrencilerin diğer insanların doğayla olan ilişkilerini nasıl gördüklerini anlamaya çalışmaktır. Bu kartlar üstünde van den Born ve arkadaşlarından (2001), van den Born (2008) ve Braito ve arkadaşlarından (2017) derlenmiş yedi adet insan-doğa ilişkisi tipi bulunmaktadır. Bu tiplere ait çizimler ve açıklamaları Ek-A’da görülebilir.

Veri Toplama Süreci

Çalışmanın verileri 2019-2020 Bahar döneminde gönüllülük esaslı çerçevesinde yarı-yapılandırılmış görüşme aracılığıyla toplanmıştır. Öğrenci velilerinin onayına dayanarak öğrenciler ile görüşme için uygun gün ve saat üzerine planlamalar yapılmıştır. Öğrencilerle yapılan görüşmeler yaklaşık olarak 45 dakika sürmüş, öğrencilerin ses kayıtları alınmıştır.

Veri Analizi

Çalışmadaki veriler, ortaokul öğrencilerinin ‘Doğa Vizyonları’ kuramsal çerçevesinde bulunan üç ögeye nasıl cevap verdiğini bulmak adına analiz edilmiştir. Veriler, öğrencilerin görüşme sorularına verdikleri cevaplardan, güdümlenmiş-gerçeklik ile doğayı hayal ederek anlattıklarından, çizimlerinden, seçtikleri kart ve nedenlerinden oluşmaktadır. Öğrencilerin ses kayıtları kelimesi kelimesine yazılı metin haline getirilmiştir. Metin haline getirilen veriler MAXQDA20 programından yardım alınarak analiz edilmiştir. Her bir öge için farklı kodlama rubrikleri kullanılarak analizler tamamlanmıştır. Nitel çalışmanın da doğası gereği, kodlama rubriklerinin bazı kısımlarında öğrencilerin cevaplarına karşılık bulunamayan

noktalar tespit edilmiş, öğrencilerin de cevapları göz önünde bulundurularak, rubriklerin belli kısımlarında kodlara eklemeler veya değişiklikler yapılmıştır. Söz konusu rubriklerden bazılarına yeni kategoriler eklenmiştir. Yapılan analizlerin geçerlik ve güvenilirliğini sağlamak adına araştırmacı dışında konuya hakim ikinci bir araştırmacı da verilerin kodlanmasına yardımcı olmuştur. Araştırmacı ve ikinci kodlayıcının yaptığı analizleri karşılaştırmak ve çalışmanın geçerli ve güvenilir olup olmadığına karar vermek için, Miles ve Huberman'ın (1994) ortaya attığı formül üzerinden kodlayıcılar arası güvenilirlik %92 olarak tespit edilmiştir.

Araştırmanın Sınırlılıkları

Araştırmanın sınırlılıkları üç farklı açıdan incelenmiştir. İlk olarak, araştırma deseninin, çalışmanın tekrarlanabilirliği üzerine bir sınırlandırmada bulunduğu söylenebilir. Yin'e (2018) göre tekli-vaka çalışmalarının çoklu veya ikili vaka çalışmalarına oranla daha az tekrarlanabilirliği olduğu öne sürülmüştür. Bu sınırlandırmanın etkilerini en aza indirmek ve çalışmanın tekrarlanabilirliğini arttırmak için okuyuculara çalışmayla ilgili detaylı bilgiler verilmiştir. İkinci olarak, çalışmanın sınırlılıklarına veri toplama araçları yönünden bakılmıştır. Nitel veri toplama ve analizi esnasında aktif rol oynayan araştırmacının da insani veri toplama aracı olarak varsayıldığı söylenmektedir (Lincoln & Guba, 2005). Bu durum düşünüldüğünde, araştırmacının çalışmada verileri toplayan ve analiz eden rolü nedeniyle bilinçsiz önyargılarını çalışmaya yansıtmış olma ihtimali çalışmayı sınırlandırmış olabilir. Bunun önüne geçmek için araştırmacı kendi pozisyon ve oluşabilecek ön yargılarını çalışmada belirtmiştir ve her görüşme sonrasında düşüncelerini belirttiği analitik notlar tutmuştur. Son olarak, çalışmada öğrencilerden çizim yapmaları istenmiştir. Çizim yeteneği olmayan ve çizim yapmayı sevmeyen öğrenciler araştırmanın bir diğer sınırlılığı olarak bahsedilebilir.

BULGULAR VE TARTIŞMA

Bu çalışmanın amacı ortaokul öğrencilerinin doğaya karşı bakış açılarının, doğaya verdikleri değerin ve nedenlerinin, insan-doğa ilişkisine karşı bakış açılarının 'Doğa Vizyonları' kuramsal çerçevesi içinde incelenmesidir. Bu bağlamda, öğrencilerle

yapılan görüşmeler sonucunda öğrencilerin doğa imgeleri, doğa değerleri ve insan-doğa ilişkisine yönelik seçtikleri tipler ortaya konulmuştur.

İlk olarak, öğrencilerin doğaya yönelik bakış açılarına dair elde edilen veriler sunulmuştur. Veri analizleri sonucunda, öğrencilerin doğayı dışarıda bir ortam olarak hayal ettikleri ve genellikle yeşil, yeşillik, ağaçlar, ağaçlık alan, orman, geniş arazi gibi kavramları kullandıkları ortaya konmuştur. Dahası, öğrenciler doğayı şehirden uzak, az insanın yaşadığı, az kirliliğin olduğu, insan elinin değmediği ve yapılaşmanın olmadığı ıssız alanlar olarak tarif etmişlerdir. Öğrencilerin doğa imgelerinin yeşil, ağaç ve orman kavramları ile sınırlı kalmasının nedeni küçük yaşlarda doğa deneyimlerini ormanlık alanlar, ağaçlıklı piknik bölgeleri, büyükanne ve büyükbabalarının köylerinde geçirmiş olmalarından kaynaklı olabilir. Öte yandan, öğrencilerin doğa imgelerinin medya kaynaklarından (Anderson & Moss, 1993) ve kitaplardan (Korfiatis ve diğerleri, 2004) etkilendiği söylenmektedir. Öğrencilerin doğaya karşı bakış açılarını ağaç, yeşillik, geniş alan gibi kelimelerle ifade etmeleri haberlerden, izledikleri filmlerden, belgesellerden, okudukları okuma ve ders kitaplarından kaynaklı olabilir.

Bunun haricinde, öğrencilerin yarısına yakını, doğayı hayal ederlerken insanların az olduğu, ıssız, şehirden uzak bölgeler ifade etmişlerdir. Bunun nedeni öğrencilerin sürdükleri şehir yaşantısında doğa ile yeterince zaman geçirememelerinden kaynaklı olabilir. Öte yandan, öğrencilerin diğer yarısı ise doğa imgelerinde kendileri haricinde, aile bireyleri ve arkadaşlarının varlığından söz etmişlerdir. Bunu belirten öğrencilerin çoğu doğayı tanıdık yerler olarak betimleyen çocuklardır. Bir diğer deyişle, bir kısım öğrencinin doğa imgelerinde aile bireylerini ve akranlarını da belirtmelerinin nedeni doğayı şehre yakın ve tanıdık yerler (ev bahçeleri, merkez yakınındaki piknik alanları) olarak algılamalarından kaynaklanıyor olabilir.

Bunların yanı sıra doğa imgeleri içinde öğrenciler en çok hayvanların varlığından söz etmiştir. Doğa deyince akıllarına hayvanlar ve bitkiler gelen öğrencilerin bu türlere verdiği örneklendirmeler günlük yaşantıda karşımıza çıkmaktadır. Öğrencilerin çok az bir kısmı vahşi doğadaki hayvanlardan bahsetmiştir. Bunun

nedeni öğrencilerin şehir yaşamında yaşamalarından kaynaklı biyoçeşitliliğin farkında olamamaları, yaşayan farklı canlı türleriyle günlük yaşantılarından karşılaşamamalarından kaynaklanıyor olabilir. Doğa imgelerinde hayal ettikleri canlı türlerini doğanın içerisinde nasıl konumlandıkları, nasıl bir ilişki içinde oldukları sorulduğunda ise öğrencilerin canlıları arkadaş olarak gördükleri ortaya çıkmıştır ve bunun nedeni biyofili hipotezinde bahsedilen insanların doğuştan doğayı sevmeye yatkın olmaları ile açıklanabilir.

Doğa imgeleri kapsamında öğrencilerin doğada hangi materyalleri kullanarak, nasıl aktivitelerde bulunduğu da analiz edilmiştir. Buradan elde edilen bulgular aynı zamanda insan-doğa ilişkisine yönelik imgeleri yorumlanırken de kullanılmıştır. Çıkan sonuçlara göre genellikle, öğrenciler ‘doğada hayvanlarla oynamak’, ‘doğayı seyretmek’, ‘doğada yürüyüşe çıkmak’ gibi tüketim yapmayan aktivitelerden bahsetmiştir. Ek olarak, öğrencilerin doğa aktiviteleri esnasında kullandıkları materyaller incelenmiştir. Yalnızca bir öğrenci doğal materyallerle (dal parçası, kozalak, ağaç) doğada oyun oynadığını belirtmiştir. Geri kalan öğrenciler ya hiç bahsetmemiştir ya da park oturağı, salıncak, kaydırak, piknik masası ve benzeri insan-yapımı malzemeler ile doğa imgelerini tarif etmişlerdir. Bunun nedeni de yine öğrencilerin doğa ile olan ilişkilerinin gelişen teknoloji, artan sanyileşme neticesinde meydana gelebilecek tehlikelerden dolayı ailelerin çocuklarını doğada vakit geçirmeye götürmemesi veya teşvik etmemesi, çocukların aktivite yapacakları ortam olarak doğayı düşünmemeleri olabilir. Doğa imgeleri kapsamında öğrenciler doğada bulununca nasıl hislere kapıldıkları hakkında da bilgiler paylaşmıştır. Katılımcıların hepsi doğaya ve doğada bulunmaya yönelik, huzurlu, sakinleştirici, mutluluk verici, özgür, yenileyen gibi olumlu duygu ve düşünceler betimlemiştir. Bunun nedeni biyofili hipotezinde bahsedildiği gibi insanların doğaya karşı kalıtsal olarak sevgi ve ilgi beslemeye yatkınlığından kaynaklıyor olabilir. Genel anlamda öğrencilerin doğaya karşı bakış açılarında doğayı ve doğada bulunan elementleri bilimsel bir bakış açısıyla açıkladığı ve çoğunlukla biyotik ve abiyotik faktörlerin üzerinde durduğu gözlemlenmiştir, ancak görüşlerinde doğanın estetiği, toplumsal bakış açıları, etik, ekonomik durumlar bu bakış açısının içerisine dahil edilmemiştir. Bu

durum sürdürülebilir kalkınmanın eğitim programlarına daha fazla entegre edilmesi gerektiğini gösteriyor olabilir.

İkinci olarak, öğrencilerin doğaya karşı verdikleri değeri ve nedenlerini ortaya koyan veriler paylaşılmıştır. Yapılan analizlere göre, katılımcıların hepsi doğayı önemsediklerini ve doğanın vazgeçilmez olduğunu vurgulamıştır. Doğanın neden önemli olduğu sorulduğunda öğrencilerin paylaştığı nedenler genellikle araçsal değerler kapsamında incelenirken, çok az öğrencinin değerleri içsel olarak kategorize edilmiştir. Araçsal değerlere sahip olan öğrenciler, doğanın neden önemli olduğunu insanların hayatta kalmasını sağladığını söyleyerek belirtmişlerdir. Diğer bahsedilen araçsal nedenler ise doğanın insan sağlığına hem fiziksel hem de mental açıdan yararlı olması, doğanın dinlenmek için önemli olması ve gelecek nesiller adına korunması gerektiği için önemli olduğu şeklinde sıralanmıştır. İçsel değere sahip olan öğrenciler ise doğanın hayvanlar ve bitkiler için önemli olduğunu söylemiştir. Bu öğrenciler, doğanın önemini insanların ondan fayda sağlaması bakış açısıyla açıklamamışlardır. Bu iki kategori haricinde doğanın güzel olmasının önemi ve doğanın Allah tarafından yaratıldığı için önemli olması kategorileri öğrenciler tarafından aktarılmıştır. Bu bulgular ele alındığında, öğrencilerden az bir kısmının içsel değerlere odaklanmasının sebebinin içsel değer kavramının soyut ve anlaşılması güç olarak görülmesidir (van den Born, 2008). Bunun yanı sıra, öğrencilerin büyük bir çoğunluğunun araçsal değerler kapsamında doğanın önemini vurgulamasının birçok nedeni sıralanabilir. Bunlardan bir tanesi, düşük ve orta gelirli ülkelerde yaşayan kişilerin doğayı gelir kaynağı olarak görüyor olması olabilir.

‘Doğa Vizyonları’ kapsamında ele alınan üçüncü öge insan-doğa ilişkisine yönelik bakış açılarıdır. Katılımcıların bu konudaki bakış açıları iki ana başlık altında incelenmiştir. İlk olarak, öğrenciler doğa ve insan arasında olması gereken ilişkiyi ifade ederken, kendilerinin bu konu hakkındaki düşüncelerini belirtmişlerdir ve kendilerine en yakın gelen tipi seçmişlerdir. Bu başlık altında çıkan verilerde, öğrenciler insan ve doğa arasındaki ilişkiyi Koruyucu, Partner (Ortak), Katılımcı ve Doğayı Uzaktan Koruyan tipolojilerle bağdaştırmıştır. Çıkan ana sonuç, insanların doğayı koruması gerektiği yönündedir. Bunun nedenlerinden birisi din olarak İslam

kültürünün yaygın olduđu ÷lkelerin toplumlarında doęayı korumak gerektięi bilincinin yerleşmiş olması olabilir. Bunun dışında öğretilen fen bilimleri konularında çevrenin korunması gerektiğine yönelik örnekler verildięi için öğrenciler Koruyucu tipine kendilerini daha yakın görmüş olabilirler.

İkinci olarak, katılımcılara şuan ki Dünya’ımızda kendileri dışında dięer insanların doęayla olan ilişkileri sorulmuştur. Analizler sonucunda, öğrencilerin dięer insanların doęayla olan ilişkilerini Kontrolcü ve Umursamaz tipolojileriyle ilişkilendirdięi gör÷lmüştür. Öğrencilerin konu hakkındaki temel görüşleri dięer insanların doęayı kontrol ettięi, kendi çıkarları için doęayı kullanıp dengesini bozduęu ve umursamaz tavırlar sergiledięi yönündedir. Bunun yanı sıra, öğrenciler dięer insanların doęayla olan ilişkisini tarif ederken birden fazla tipolojiden bahsetmiştir. Bunu yaparken insanları ‘iyi insanlar’ ve ‘kötü insanlar’ olarak ayırt etmişlerdir. Bu kapsamda, öğrenciler, kimi insanların doęayla olumlu ilişkiler sergilediğini, kimi insanların ise doęayla negatif ilişkiler kurduğunu belirtmiştir. Öğrencilerin farklı tipolojilerle insan-doęa ilişkisini açıklamasının nedeni insanların farklı yaşam stillerine, kültürlerine, değerlerine, deneyimlerine ve gözlemlerine baęlı olarak doęayla farklı ilişkiler kurmasından kaynaklanıyor olabilir.

Bu bulguların yanı sıra, ‘Doęa Vizyonları’ kuramsal çerçevesinin altında incelenen üç öge arasında ilişkiler kurulmuştur. Öğrencilerin doęaya yönelik hisleri ve deneyimlerinin de bu üç element ile nasıl bağdaştırılabileceęi tartışılmıştır. Yapılan araştırmalara göre doęaya karşı olumsuz hisler besleyen insanların doęayı kontrol etmeye daha yatkın oldukları ortaya atılmıştır (Flint ve dięerleri, 2013). Tam tersine, doęaya karşı olumlu hisler besleyen insanların ise doęayı korumaya yönelik görüşlerinin ön plana çıktığı tahmin edilmektedir. Bu bağlamda, çalışmadaki öğrencilerin doęaya karşı olumlu hisler beslemesi nedeniyle, olması gereken insan-doęa ilişkisine yönelik fikirlerinin genellikle Koruyucu tipinde bulunması şaşırtıcı değildir. van den Born’un (2008) araştırmasındaki bulgulara göre insanları doğanın bir parçası olarak gören kişilerin daha çok içsel değerler nedeniyle doęayı önemsettięi gör÷lmüştür. Zıt olarak, yapılan çalışmada öğrenciler insanların doğanın bir parçası olduęunu düşünmelerine rağmen doğanın önemini araçsal değerlerle

açıklamışlardır. Bunun nedeni öğrencilerin ‘doğanın parçası olmak’ kavramını Koruyucu ve Partner (Ortak) tiplerinin özellikleriyle bağdaştırması olabilir. Öğrencilerin doğa imgeleri ile doğaya verdikleri değer tartışıldığında, el değmemiş, yeşillikler içinde olan ‘vahşi doğa’ bakış açısının, insanların kullanımı için yararlı olacak doğal kaynak tedarikçisi olarak görüldüğü bulunmuştur (Bujis, 2009). Buna paralel olarak çalışmada, öğrenciler doğa imgelerini genelde ağaçlar, ormanlar olarak ele aldığı için doğanın önemini araçsal değerler ile anlatmış olmaları alanyazındaki diğer çalışmalarla benzer bir sonuç sunmaktadır.

Eğitim Uygulamaları ve Öneriler

Çevre eğitimi programlarının tek bir bakış açısıyla, daha çok insan-merkezli değerler ile yapılandırıldığı gözlemlenmiştir (Flint ve diğerleri, 2013). Bu çalışma sayesinde, öğrencilerin sahip olabileceği farklı görüşler ışığında eğitim programları yeniden gözden geçirilerek, farklı bakış açıları öğretim programlarına adapte edilebilir. Eğitim materyallerinde öğrencilere çeşitli görseller ve doğa ile ilgili çeşitli ikilemler verilerek öğrencilerin kendi görüşlerini paylaşmaları, nasıl önlemler alınması gerektiğine dair karar vermeleri sağlanabilir. Bunun dışında, çalışmadaki bulgulara göre öğrencilerin doğa ve insan-doğa ilişkisine yönelik ekonomik ve sosyal açılardan görüşlerini az da olsa bildirdikleri, politika açısından ise hiç görüş sunmadıkları görülmüştür. Bu nedenle öğrencilerin sürdürülebilir kalkınma kapsamında düşünebilmesi ve çevrelerinde gerçekleşen olaylara birden fazla açıdan yaklaşabilmeleri için çalışmadan çıkan veriler ışığında eğitim programlarına birden fazla bakış açısı eklenebilir.

Bu çalışma 5. ve 8.sınıf öğrencileriyle yapıldığı için, ileri çalışmalarda farklı yaş gruplarındaki öğrencilerinden de veri toplanarak öğrencilerin doğaya karşı bakış açıları, doğaya verdikleri değer ve insan-doğa arasındaki ilişkilerine yönelik görüşleri daha kapsamlı bir çalışma olarak sunulabilir.

Bu çalışmada öğrencilerin doğa üstünde teknoloji kullanımı hakkındaki fikirleri de kısaca paylaşılmıştır, ancak çalışmanın ana amaçlarından birisi değildir. Bu bağlamda, teknolojinin hızla geliştiği ve insanların yaşantısının her alanına yayıldığı

bugünlerde öğrencilerin teknolojiye olan bakış açıları, insan-doğa ilişkisinde teknolojinin yeri, teknolojinin doğa üstünde ne derece kullanılması gerektiği ve doğaya verilen değer ve teknoloji arasındaki bağlantının kurulması gibi konularda öğrencilerin bakış açıları alınarak ileri çalışmalar yapılabilir. Çalışmanın bulgularında öğrencilerin doğaya yönelik bakış açılarının, doğaya verdikleri değer ve insan-doğa arasındaki ilişkilere yönelik görüşlerinin ders kitaplarındaki resim ve yazılardan etkilenebileceği tartışılmıştır. Bu bağlamda düşünüldüğünde, Fen Bilimleri Dersi Öğretim Programı (MEB, 2018c) kapsamında işlenen ortaokul kitaplarının içeriğinde yer alan metaforlar, söylevler, resimler ve figürler içerik analizi yöntemi yardımıyla ileri bir çalışma olarak yapılabilir. Bu sayede derslerde kullanılan kitapların içeriğinde verilen resimler tekrar düzenlenerek içsel değerlere sahip, çevre eğitiminin tercih ettiği Koruyucu veya Partner (Ortak) tiplerinde öğrenci yetiştirilmesine olanak sağlanabilir (Li & Ernst, 2015).

Alanyazında yapılan çalışmalarda insanların doğaya olan bakış açılarının, verdikleri değer ve insan-doğa ilişkisine yönelik görüşlerinin kültürel farklılıklardan kaynaklı olarak değişiklikler gösterdiği öne sürülmektedir (Stern & Dietz, 1994). Türkiye'nin de sahip olduğu etnik köken zenginliği baz alınarak farklı kültürel arka plana sahip olan öğrencilerin Doğa Vizyonları araştırılabilir. Bu sayede Li ve Ernst'in (2015) bahsetmiş olduğu ülke içindeki dünya görüşlerindeki farklılıklar incelenebilir. Ayrıca, ülke içinde farklı kesimlerde (kırsal ve şehirsal) yaşayan öğrencilerin insan-doğa ilişkisine yönelik dünyagörüşlerinde farklılıklar gözlenip gözlemlenemeyeceği araştırılabilir. Farklı bir açıdan, bu çalışmadaki öğrenci grubunun sosyo-ekonomik arkaplanı hakkında daha detaylı bilgiler toplanarak öğrencilerin seçtiği insan-doğa ilişkisi tiplerinin değişime uğrayıp uğramadığı incelenebilir. Buna benzer olarak, öğrencilerin seçtikleri tipolojilerin, Piaget'nin (1951) bilişsel gelişim süreçleri veya Kohlberg'in ahlaki gelişim düzeyleriyle ilişkileri incelenebilir. Bu gelişim süreçleri göz önüne alınarak, öğrencilerin doğaya bakış açılarının en çok hangi etmenlerden etkinlediğini incelemek amacıyla da ileri bir çalışma yürütülebilir.

Braitto ve arkadaşlarına (2017) göre Kontrolcü, Umursamaz ve Uzaktan Doğa Koruyucu tiyolojiier, doğaya yönelik çevreci davranışlarla negatif ilişki gösterirken; Koruyucu, Partner, Katılımcı ve Kullanıcı tiyolojiier, pozitif ilişki ile açıklanmıştır. Bu çalışmanın bakış açısı davranışlar olmadığı için, ileriki çalışmalarda hangi tiyolojiye sahip kişilerin ne tarz davranışlar sergilediğine dair bir çalışma yürütülebilir. Diğer bir deyişle, insan-doğa ilişkisi tipleri ve kişilerin çevreye yönelik davranışları arasındaki ilişki incelenebilir.

