

DESTRUCTION OF LIVING SPACES
3D DIGITAL ORIGAMI FOR THE CHILDREN BETWEEN 7-12

by

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Abstract

A different visual representation was pursued in this project which was aimed to catch children aged between 7-12 attention to the problems of the environment. In the light of this research origami was selected as visual medium and origami models have been crafted in 3D format digitally and have been used in posters and animations. While problems of nature were expressed in the animations, practical solutions are given in the posters and importance of recycling was highlighted.

Works have been done in the project have been shown to a child psychologist and ways to catch children attention have been asked. In the scope of the project digital origami works with similar target groups and their successes have been analyzed.

All the works created were collected in a digital interface and presented with additional elements to catch children attention.

Final works of the project were presented to the members of SEV Üsküdar İlköğretim Okulu Environment Club and their responses were noted.

This project was created to remind environmental consciousness and practical solutions for the children who are future of our world.

YAŞAM ALANLARININ YOK OLMASI
7-12 YAŞ ARASI ÇOCUKLAR İÇİN 3B DİJİTAL ORİGAMİ

CANDAŞ DEMİREL

Görsel Sanatlar ve Görsel İletişim Tasarımı, Yüksek Lisans Tezi, 2011

Tez Danışmanı: Yoong Wah Alex Wong

Anahtar Kelimeler: Origami, Çocuklar, Çevre

Özet

Çevresel sorunlar hakkında 7-12 yaş arası çocuklarını bilgilendirmek amacı ile yapılan bu projede çocukların ilgisini çekebilmek için değişik bir görsel yol aranmıştır. Bu araştırmanın sonucunda görsel sunum şekli olarak origami belirlenmiş ve origami modelleri dijital olarak 3 boyutlu ortamda hazırlanmış, poster ve animasyonlarda kullanılmıştır. Animasyonlarda çevre problemleri dile getirilirken posterlerde bu problemlerle ilgili pratik çözümler sunulmuş ve geri dönüşümün önemi vurgulanmıştır.

Proje kapsamında yapılmış olan işler bir çocuk psikoloğuna gösterilerek fikir alınmış ve çocukların ilgisinin daha fazla nasıl çekileceği araştırılmıştır. Proje araştırmaları kapsamında benzer hedef kitleleri olan dijital origami işleri incelenmiş ve başarıları göz önüne alınmıştır.

Oluşturulan tüm işler bir dijital arayüzde toplanmış ve kullanıcı çocukların dikkatini çekebilmek için değişik eğlendirici öğeler eşliğinde sunulmuştur.

Proje sonucunda oluşan işler SEV Özel Üsküdar İlköğretim Okulu Çevre Kulübü öğrencilerine sunulmuş ve fikirleri kaydedilmiştir.

Bu proje geleceğin teminatı olan çocuklara çevre bilincini hatırlatmak ve dikkat edebilecekleri pratik çözümler sunmak için geliştirilmiştir.

I would like to thank my advisor Yoong Wah Alex Wong for all his help and his infinite patience, to Wieslaw Zaremba and Onur Fatih Yazıcıgil for all their contribution and their time.

Special thanks to E. Çiğdem Artan, Hasan Kemal Uysal, Ercan Eroğlu and Selen Ayas for all the help they have given me during the project.

At last I would like to thank my family who supported me all the way.

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The Significance of the Project Study

When my generation met with internet, there was no social networks. One had to wait for several hours even for listening a single song, but now most of the teenagers are coming across a lot of videos, animations or social campaigns everyday through different social networks like facebook, youtube and many other social networks on the web. This study, with help of short 3d animations and posters, aims to point out bad human impacts on world and gets children attention to the subject, especially to the destruction of the living spaces and endless demand for more resources, since the human beings consume nature unconsciously and destroys living spaces of animals and plants and become a successful social campaign. Furthermore, in the present day's consumer society, it is inevitable to think about the threats in the future of the world nature and preventions. In order to prevent the destruction of ecosystem, it is important to highlight reliable and renewable energy sources such as recycling to prevent water, air, soil pollutions and destruction of living spaces due to pollutions and express the ideas to the children who are our world's future consumers.

The main goal of the project is to create an awareness about our biosphere's problems; Expressing a topic in that caliber with an animation must be catchy in a visual pattern and the message must be given as frankly as possible with style. Due to technological developments in computer graphics area, visual quality of animations has been improved drastically. Every year many new animated movies produced and children are getting used to "perfect animations" day by day. In digital environment we live, it is a difficult task to get attention of a child visually. Among all creative processes, it is quite hard to create a unique visual language but something uncommon must be presented to ensure for getting their attention. Digitally folded origami in animations and posters that show an environment created and populated with origami can create that opportunity to showing them something different. It is safe to say that beauty and ugliness is relative and differs with time and place, but origami is an ancient and mystic art form evolved during time.

On the other hand, origami fits to this study in the context of its material. Origami can simply be defined as a traditional art of paper folding, and one of the most consumed materials in the world is paper, which is a threat for the future of the forests in case of an excessive usage. For example, “12.5 million tonnes of paper and cardboard are used annually in the UK”¹ and “it takes 24 trees to make 1 ton of newspaper.”¹ Furthermore, all people are familiar with this situation. At this point, using a paper art will reinforce the message that I am trying to give. Indeed, I tried to create a non-linear, non-narrative image presentation to pass the information. It is not a story, but a collection of data. A narrative linear animated video would not be relevant to my goal. Therefore, I chose to create a representation, which is composed of a collection of short 3D animations, and reinforced by narration and typography and posters and give present them in a flash interface.

In addition, in technical context, origami gives a perfect visualization opportunity to represent the cycle between resources and productions. It is easier to representing raw resources while they were becoming products. It is both understandable and plain. Characters and elements created with origami developed a visual consistency in animation. This is another important issue, since one of the reasons behind this study is to show human beings are only a part of the nature and equally important with other creatures in the world and origami underlines we all were composed of the same materials with the rest of the nature.

Last but not least, origami is a perfect candidate to catch children attention, because other than a hobby, in the present day origami is generally done by children during early school period; hence, since they are familiar with the material and paper folding, this study can catch their attention and they can improve their knowledge on the impacts of excessive consumption and wasting of world resources.

Divisions of the Project Study

This study is composed of three main focuses: first in a methodology part which consists the design and process steps, researches linked directly to the project and comparisons of other digital origami projects and projects aim for children created by environmentalist NGO's. Also results of a survey with the children about their opinions on the project. Second, destruction of world resources and preventions, and third, origami as a traditional art of paper folding as a general knowledge reminder.

In the methodology chapter reasons behind the specific target group, visual language and process styles will be explained in detail. In second chapter, the current circumstances in world resources and types of pollutions will be discussed through suggestion certain solutions such as recycling, and in the final chapter, origami will be explained including its history and different styles.

Methodology of the Project Study

As mentioned before the main reason behind this project is to create an awareness about problems inhabitants of our world, we and other creatures, meet in our habitats like pollution, deforestation, and loss of living space. After deciding to create this project I started to think about using traditional origami models and folding structures for composing the animation and decided to use traditional fold styles in a 3d animation is not a unique thing but is quite uncommon. Following task was to define target audience. It is very important to choose right target group because it would be waste of time and labor for trying to impress a not interested group. At that point, it is logical to choose children as a target audience for that purpose because they are the future. First target audience for the project was the age group between 12 and 15 known as the adolescence. There were specific and scientific reasons behind that choice. During

adolescence period children experience a lot of transformations both physically and emotionally. When we analyze intellectual developments children experiences in that period, we can see children thrives on arguments and discussions, increasingly able to memorize; think logically about concepts; engage in introspection and probing into own thinking; plan realistically for the future, and most importantly they need to feel important in world and to believe in something.² Those specifications would give me the chance to effect them in a good way towards an environmental conscious.

Defining of the target audience leads me to processing period. During that period I examined a lot of origami models and works from different origami artists and before I selected which models/characters would be included to my project, I folded all the models physically with paper to ensure feasibility, to define visual style of the project and develop my poor origami skills. Developing my origami skills was important because I would like to use “storigami”, which will be discussed in following parts of this paper, technique in the presentation which I would make for children. Also having models physically presented me the opportunity of getting other people's critiques before digital production. After that point, in the light of selected models plots of the animations emerged. Physically folded models simplified the works on computer because I could have predicted problems I would encounter and can modify the characters digitally by looking the defects on physical models. One of the reasons I choose to create models digitally, physical models loose their meanings if they would not have folded perfectly and ability to fold perfect origami models require years of practice on the subject which I lack.



Figure I- Origami Penguin

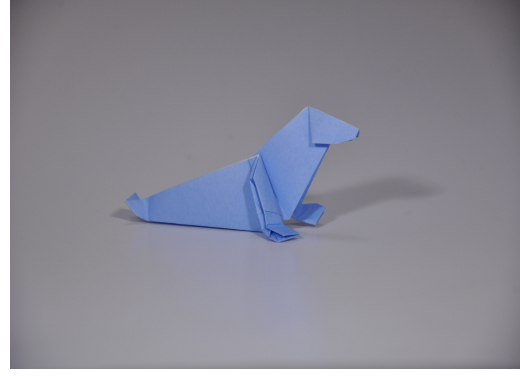


Figure II- Origami Seal

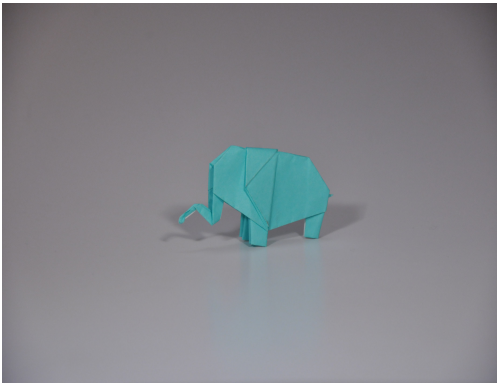


Figure III-Origami Elephant

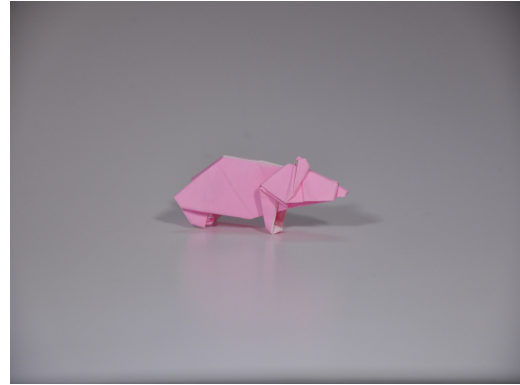


Figure IV- Origami Bear

When creating something targets children intellectuality it is ethically required to consult a children psychologist. To met that requirement an interview has been made with children psychologist Ercan Erođlu, a member of Istanbul University apa Medical Faculty Child Psychology Division, and these questions are presented to him with the visual samples of the project;

Are the children between 12-15 correct choice as a target audience for the project?

What are the characteristics of that age group?

How can their attention can be caught?

What kind of strategy should be followed to give the necessary messages?

Would this project can affect children in a bad way?

His answers made a huge contribution and changed target audience of the project to children between ages of 7 and 12. Because Mr. Erođlu stated that attention of children in the adolescence period focuses on people or trends they idolize like rock

stars, movie or game characters or other public figures like celebrities. On the other hand it is easier to catch younger children attention. While they are trying to explore their environment it is a fact that visuals and colors get their attention more easily than older children. Cartoon like “cute” visuals and characters which my project possesses and melodies which they are acquainted with such as soundtracks of cartoons and games are good candidates to get their attention. Also he mentioned that learning and perception speed of children are much more faster than teenagers and my project can make the contribution I desired more effective than books thanks to giving the message both visually and audibly. He underlined that children in that age group would not be influenced from typography and using font of their school books would created a consistency by following the visual pattern they get used to. Another think he pointed out is about narration. Selen Ayas, an other psychologist who works for the Justice Department as a psychological consultant, explained that a women narrator could reminiscent of their mothers voice and can arouse sympathy and mercy but worry too. A male narration could become more didactic They both also added not to use tanks, sudden color changes and conflicts in the project due to their possible negative effects on children. With all those characteristics it is a great era with hunger for knowledge and guidance. If we can manage to point that hunger and need in right direction they would be conscious adults in the future. In my project I tried to make a contribution to that guidance.

While the characters and environment in my project formed, I had chance to ask people around me about their opinions about the characters and ,even beauty is a relative issue, the answer was generally “they are cute”. Cuteness can create a sympathy for creatures shown in desperate situations. The reason behind that “cuteness” lays in the character selection process and in the field study. I excluded some of the models I have created from the project after I showed models I fold to the people around me, because they were defying the visual consistency which I was trying to establish by cuteness.

During childhood period, most of the children folded and played with paper planes or boats. Also in craft lessons most children fold paper in elementary schools. It can be said that children are accustomed to paper-folding. Reason I choose the term

paper-folding over origami while they mean same thing is traditional Japanese origami is not very common in Turkish educational system and it adds mystery to the project.

Visual designing process cannot develop and evolve without looking over different works on the similar subjects created by other people. When we look for other digital origami projects, plenty of them can be found on the internet. As mentioned before beauty is a relative concept so it would not be ethical to discuss that they are whether beautiful or not but as a visual designer I would like to mention my findings and opinions about ones which have impact on my project or have some kind of relation, technically or ideologically, with my project.

When I analyzed other examples I came across three main styles, general and the most common technique we encounter is stop motion. Those animations generally consist of the folding of the models frame by frame or movements of the origami models on the scene as an animation. They differ from school projects to commercial advertisements. It is very logical to use stop motion in origami based animations. Structures of origami models give artists opportunities to make audience a part of the process where the characters come into being frame by frame. Most of the designers and artists use that opportunity. On the other hand, to achieve a smooth animation consists steps of folding requires talented origami artists who ensures continuity of the models without deformations. Without a designer or artist who have a lot of experience with origami, models can be damaged and visualization of the project can be jeopardized. I would like to focus on some examples as I mentioned before;

Stop motion Toshiba advertisement³ (figure V) created by Grey Düsseldorf and animation named “Beautiful” for Traffic- the wildlife trade monitoring network⁴ (figure VI) are very creative and successful examples created by stop motion technique, but especially “Beautiful” deserves a special interest and part in this thesis because of its topic and simple yet dramatic visual language. Even origami Toshiba advertisement is the first 3D advertisement and also share the same idea of my thesis which everything came from same subject. (in Toshiba advertisement, main idea is “everything is an empty paper first”) “Beautiful” has a social message. Also story telling and visual style of beautiful is very plain and strong. I adopted their method of showing a beautiful, happy scene followed by a dramatic scene where the message is given. It is just like using an emotional contrast in the animation for supporting the main idea.



Figure V- Stop Motion Toshiba add

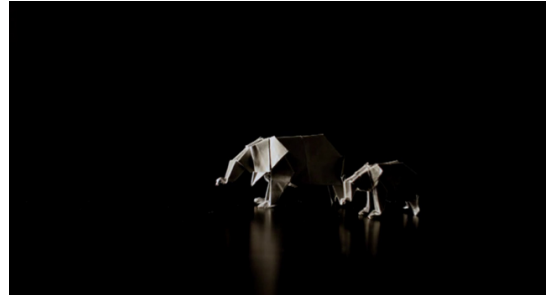


Figure VI- Beautiful

“The Paper Fox” project of Jeremy Kool ⁵ (figure iii) is the only project that I came across which all the characters and the landscapes are created digitally in 3D form. They are not actual origami models but what Jeremy Kool tried to achieve was to show them look like real origami. Aim of his project was to create a children book for digital tablets. It is safe to say that he managed a great job. As both of my and The Paper Fox project shares similar target audience and technique. This project is unique in both character and environmental aspects. All the characters and environment designed to look like created from paper and the color palette is incredible. It levitated my ideas and show me what a children must feel when they come across a successful project.

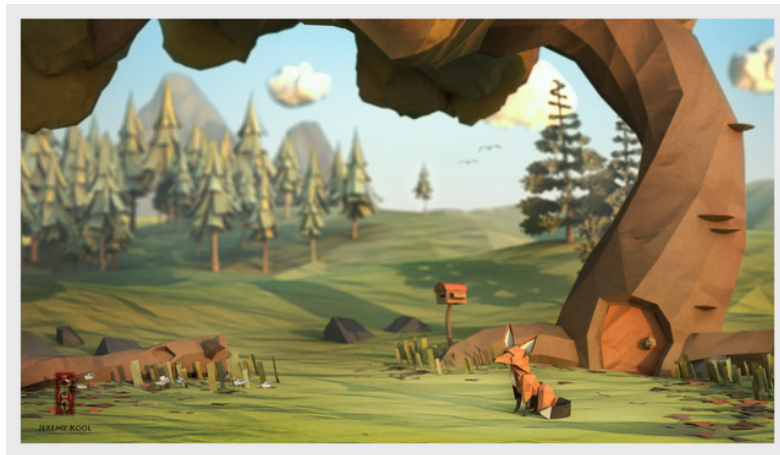


Figure VII- Paper Fox

Third style I encountered was 2D cartoon with use of origami characters. Award winning Papiroflexia⁶ created by Joaquin Baldwin is “the animated tale of Fred, a skillful paper folder who could shape the world with his hands”⁶. It affects the viewer in an emotional level with its combination of music and visuals and it is important because

it shows the viewer that origami can be used as a medium for creating a unique visualization.



Figure VIII- Papiroflexia

This is not the first project tries to underline the concerns about environment for the children. There are many conscious environmentalist people and organizations they found around the globe with the aim for a better and greener future. WWF, GreenPeace and TERI are all NGO's with the same general purpose. They are continuously creating projects to educate people about ways to preserve nature and habitat. When we check their websites we can see they all have projects aiming for children. It is vital to analyze their projects aiming for the children. WWF (World Wildlife Fund) created flash games with environmental topics. Also Teri.org created EduGreen child education project for children where they give small tips for children for saving the environment. In the light of these campaigns , I decided to create a flash interface and flash game using the same course as the environmentalist NGO's followed by entrusting their years of experience in the subject.

At the end what I created are 4 short animations, 3 posters and1 flash game all with the main idea of environmentalism and aim to raise consciousness about subject. If we take the posters and the animations as sub categories, general awareness about the problems tried to underlined with the animations while educational posters tell the solutions about the problems. “Arial” font was chosen to increase the affect of the messages given. Standard font of Turkish elementary school books differ from book to book, but many of them was written with arial font, also arial is the main font for “Windows”, so it is safe to say “Arial” is the font children used to most. Game and the origami diagram of the “crane” aim for the audience's attention. During the presentation for the children origami diagram of the crane would be shown part by part to follow storigami technique.

A presentation has been made to the students of “Özel Üstküdar Sev İlköğretim Okulu” for analyzing the outcomes of the project. Presentation contains representation of posters and animations and an origami workshop. I tried to use storigami to catch children attention. According to their teachers and my observations presentation was successful. During the presentation I asked them specific questions about the information on the posters and I saw that they have read the posters and remembered the given information. After the presentation, I asked some questions to the participant children and requested to answer them. The questions were:

1- Did you like this work study?

2- Did this study catch your attention / Did this study affect you?

3- How can it be more interesting?

4- Did you enjoy origami?



Figure IX- Presentation to Children1



Figure X- Presentation to Children2



Figure XI- Presentation to Children3

The results of this survey showed me the drawback of group study with children. They generally gave the same answers to the questions. The answers were:

- 1- They liked the presentation and the works done.
- 2- The works done have caught their attention, also I realized that they have enjoyed posters much more than the animations.
- 3- Answer of this question make me understand that to select origami as a medium and cute creatures as characters were the right choices. General answer was they would me more interested if I would have showed them how to fold penguin.
- 4- They all liked origami very much and requested me to give them the remaining origami papers I have.

The flash game and the user interface must be tested on internet with a larger study group for a better and more accurate result.

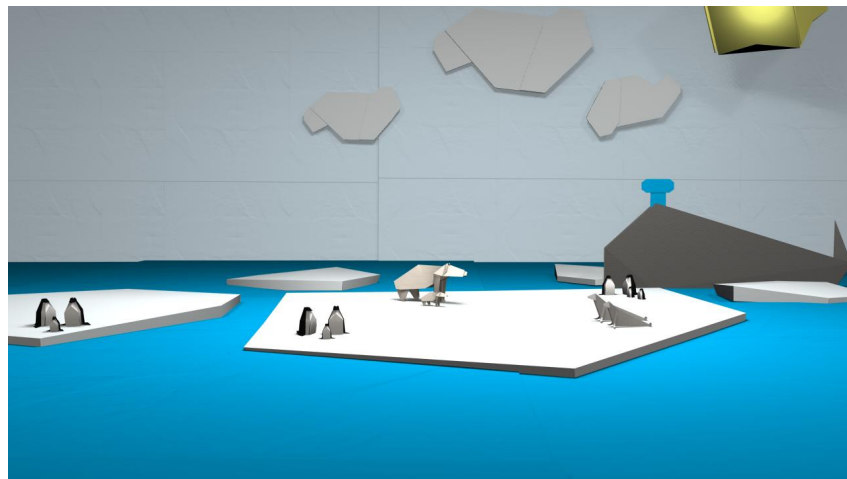


Figure XII- Scene Sample



Figure XIII- Poster 1

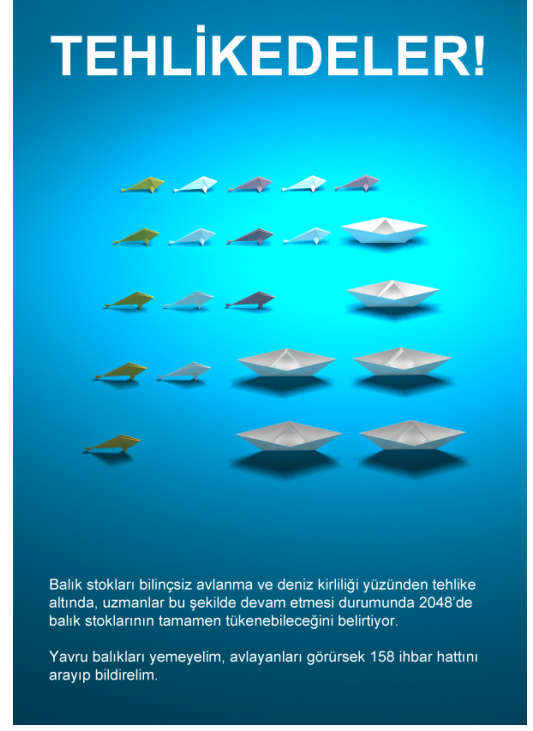


Figure XIV- Poster 2

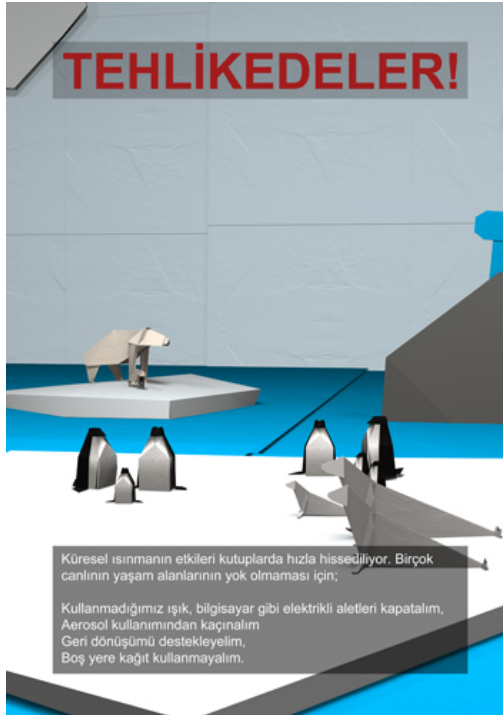


Figure XV- Poster 3



Figure XVI- Interface Sample

Consumer Society and Threats in the Future of the World Nature

“The past few decades have seen the rise, here in America, of a new and unique phenomenon in human history, the mass consumption society.”

George Katona, *The Mass Consumption Society* (1964)

Baudrillard determines that “consumer society is not characterized merely by the rapid growth of individual expenditure. It is also accompanied by the growth of expenditure met by third parties (by the government in particular) for the benefit of private individuals, the purpose of some of this being to reduce the inequality of the distribution of resources.”⁷ Especially for the post World War II period, it is possible to argue that the initiatives of the government to ameliorate the equality of public access to the resources, have mostly caused consumer society. In other words, “state subsidies for various forms of market consumption have increased to fill the vacuum left by the receding boundaries of the welfare state.”⁸

Hence, following the emergence of consumer society and the Nuclear Age, climate change has occurred as a concrete problem of our epoch. It is possible to detect its effects all around us, such as polar ice melting, increase of sea level, changes in climate conditions and the appearance of inordinary natural events. The desire to stop climate change and improve reliable energy sources depends on both governmental and individual efforts.

In this chapter, first, threats in the future of the world nature regarding the emergence of consumer society will be discussed, then, causes of the climate change will be elaborated, and finally, the focus will be the current situation in Turkey through the examples from the diverse non-profit organizations and social campaigns.

Threats to the World of Nature

"Eventually we'll realize that if we destroy the ecosystem, we destroy ourselves."

*Jonas Salk*⁹

The statistics tell us that the alarm bells are ringing. According to the World Resources Institute, more than 80% of the Earth's natural forests have been already destroyed.¹⁰ Nevertheless, every part of the nature is linked to each other and it is a chain reaction. In addition, it is obvious that deforestation and forest degradation are both causes and consequences of climate change. "Among the obvious consequences of deforestation is the loss of living space. Seventy percent of the Earth's land animals and plants reside in forests."¹⁰ According to Worldwide Endangered Animals List, over ten thousand animal species face danger of extinction¹¹, and if we add plants, the sum will be more than twenty thousand¹²; one bird out of eight, one mammal out of four, one conifer out of four, one amphibian out of three, six marine turtle out of seven are under thread of extinction.¹³ In fact, everyday new species are facing the risk; hence, the list of animals at risk continues to grow. On the other hand, it is possible to determine several

other factors that cause the crisis, including pollution, global warming, overfishing, unconscious hunting and etc.

The appearance of first life on Earth is based on approximately 3.8 billion years ago. In that epoch, it has been estimated that more than 99.9% of all species will have gone extinct through the years.¹⁴ In the present day, the total of all the species on earth represents less than 1% of all the species have existed on earth since the beginning. Billions of species have been extinct during history. Besides, most of species have faced mass extinctions. In addition to that, the mass extinction took place around sixty-four million years ago which resulted with the extinction of dinosaurs as it is the most famous extinction case among all.¹⁵

On the other hand, extinction is one of the basic characteristics of nature and evolution. Under normal circumstances, the species have life expectancy, but the mass extinction cases generally occur due to outside effects and pay the way for the emergence of new species. As an example, after the dinosaurs' mass extinction, a new era begun with the mammals. Nevertheless, the worst possible outcome of this period of disturbing natural balance would be human beings that become new outside effect and this would end the era of mammals.

Human beings are relatively very young specie in the world history. Humankind came into being around 200.000 years ago, and lived as a part of the nature in harmony as hunter and gatherers for 180.000 years. After 180.000 nomadic years humans settled down and started agriculture.¹⁶ It was a giant leap for human beings to cultivate their own livestock besides hunting and gathering. Nature renewed itself a very long time and kept up with humankind's demands like shelter, fuel for heating and feeding. It is possible to argue that human race is dependent to the power of sun like the rest of the nature. People severe that dependency bond when they have realized that sun's power has been stocked for millions of years by world as fossil fuels. From that time forward, human beings created a life for themselves which is strictly depending on that power stocked. In a very short time, industrial revolution has emerged; hence, mass production became the most important part of humankind's life. In fact, while human beings population has been tripled in last fifty years, one crucial point was extremely ignored with the thrill of mass production; the energy stocked was not infinite.¹⁷ If the human race continues to consume in a similar way in the future, they will be like a giant

grasshopper swarm, which absorbs everything in their path. Too many people are using too many resources that they cannot renew and while doing that they create pollution, greenhouse gasses and destroy the living space of the creatures other than human beings.

As it is mentioned before, the mass production fundamentally changed the human kind's lifestyle. Following the industrial revolution, capitalism emerged which has paved the way for the distribution and conversion of industrial products with the objective of profit. It is literally transmuting the world resources into money, which is also a surreal concept that created to define and regulate distribution of the world natural resources. At this point, it is possible to argue that natural system is not working very well, since 20% of world population consumes 80% of world's resources. In addition, it is not possible to deny that learning, creating, developing and life span curves of human beings all have been gone up since the industrial revolution.¹⁷

As it is commonly affirmed, human civilization is formed with the technological and cultural advancements, which are provided by mass production. To ensure the continuity of mass production, some conditions and resources must be provided, including creation of the sufficient energy, finding necessary resources and establishing markets for distributing.

On the other hand, it is widely accepted that the drawbacks of capitalism, as a social manner, are composed of the famous demand and supply chain. American culture encouraged the demand for people to supply and the rest of the world dream about American lifestyle. In fact, there is a core issue which cannot be avoided; world cannot stand for another America.

It is quite possible to argue that United States is the world's biggest consumer and waster. United States represents 5% of the world population with its population of 300 million but it consumes at least one quarter of practically every natural resource.¹⁸ American people spend more money to maintain their lawns than India collects as taxes.¹⁶ Most of the popular culture branches are mostly American oriented, this is the main reason behind rest of world trying to get an American living. Freedom is described wrongly as the ability to get or buy whatever somebody wants. The main problem is the way we are thinking. As James Hillman said, "you cannot get enough, what you do not

really want".¹⁷ As long as we continue try to get things we do not really need, some people would race with each other for producing more of everything.

As mentioned before, human population has been tripled in last 60 years. It is quite possible to argue that this huge population boom depends directly on the fossil fuels, since people created more shelter, clothing and more food with the help of the machines run by fossil fuels. It is obvious that, a very large quantity of food is needed to feed approximately seven billion people. In addition to that the main diet for one people in every five is fish. It is known as food of the poor and most of the world population is living under poor conditions. Fish production mostly depends on hunting. Unconscious hunting is a very problematic issue over most of the coastal areas across the world. Overfishing and with the help of the water pollution caused by factories, damaged the water ecosystems and reduced the fish population. According to www.overfishing.org 52% of the fish stocks are fully exploited, 20% are moderately exploited, 17% are over exploited, 7% is depleted and 1% is recovering from depletion.¹⁹ Furthermore, scientists warned that world seafood will run out by 2048.²⁰ Depletion of fish will pay the way for the starvation of more than one billion people. In the case of the food shortage, it is quite important to remember that life began in seas. We are living on a big blue planet and if the conditions would not ameliorate, in a very short period, our children would not see living fishes in seas.

In the enlightenment of the discussion above, it is obvious that modern life in the present day depends on natural resources. Everything that people have in terms of food and tools are coming directly or after some process from the environment. Hence, it is possible to argue that the world resources sustain human life. At this point, two different problems emerge on the issue of the world resources. First problem is the energy needed and pollution created at every stage of the processes like extraction, processing, manufacturing, transferring, marketing, consumption and disposal to get resources to the usable point. The other problem is depletion of natural resources, especially fossil fuels. If human beings' life depends on natural materials and resources, it is very important to assure the continuity and sustainability of the availability of those resources. World resources can be classified in two main clusters. Firstly, non-renewable resources as fossil fuels, soil and water, minerals and metals. Those resources cannot be replenished

by natural processes and exist in a limited quantity in world. Second type of resources are the organic resources, which can be replenished again like plants and animals. On the other hand, even if they can be replenished, they are not available in infinite quantities and their replenishment speed cannot match the rate of people's consumption.¹⁷

Hence, it obvious that the world we live on has finite resources and while people cannot distribute the resources equally, everybody is getting their share from pollution. In addition to that, many species cannot continue survive in human dominated habitats. People are destroying the wild life and going for a point without any return and the most terrifying thing, nobody knows what would happen while they are doing anything.²¹

At this point, it is quite clear that all the nature need is a recyclable economy through looking into ways to replenish resources and less pollution creating ways to achieve energy. In the next two chapters, pollution types and recycle cycle will be discussed as it is a part of reliable energy source in the manner of replenishing resources.

Environmental Pollution Types and Effects on Environment

Sir Isaac Newton stated in his third law, "There is a reaction for every action." It can be adapted to our environment and defined as "There is a pollution for every production". As mentioned in previous paragraphs environmental pollution is one of the causes of most of the problems our biosphere endures.

Environmental pollution can be defined as "the contamination of the physical and biological components of the earth/atmosphere system to such an extent that normal environmental processes are adversely affected."²² In other words environmental pollution is spoiling of our *Mother Nature* with the products of our activities. Every other living organism reside on earth take some materials from natures resources, process them for their biological survival purposes and give back as different materials after the process, but those chemical or physical processes are part of some natural

cycles. On the other hand we, as humankind, do not only manipulate materials nature presents us for our biological needs but for to enhance our living conditions and give back tons of new, unnatural substances to the world. Those new materials are not part of any cycle because natural cycles formed long time before they existed. Problems start at that point, because those materials do not decompose for very long time and try to blend in to already existed loops. Accumulation of those unnatural, non-degradable, matters leads to air, water and soil pollutions.

Air pollution is contamination of the indoor or outdoor environment by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere.²³ Substances released to the atmosphere as a result of human activities which can cause problems living things. The most common type and reason of air pollution is release the gasses product of the combustion of the fossil fuels.²⁴ Some of the gasses such as sulfur dioxide, carbon monoxide, nitrogen oxides and other kinds of chemical vapors from industrial sites can take part in further chemical reactions in the atmosphere and affect us and other creature and plants by forming smog and acid rain in addition to their effects on our respiration systems.²⁴ Continuous deforestation raise effects of air pollution.

Individual measures can make positive impacts on air pollution levels. Just using forms of public transportation instead of personal automobile is a very affective step. A lot of organizations like The Energy and Resources Institute are creating projects to make children conscious about the subjects. EduGreen is a website created with that purpose by The Energy and Resources Institute.

Water pollution is caused by the toxic substances leakage to water bodies such as lakes, rivers, oceans, underground waters and seas. Substances in question degrades the quality of water by dissolving in them and can affect us directly.²⁵ As water covers more than %70 of our planet's surface and compose majority of our body structures, it has the biggest and the most noticeable natural cycle. Alongside damaging the aquatic ecosystems, toxic substances also flow through and reach to our fresh water supplies and contaminate water we use for our daily needs which includes drinking.²⁵ Causes of water pollution are often be man-made wastes. Those man made wastes consist of sewage and waste water, marine dumping, industrial waste, oil pollution, leakages from underground storage facilities, atmospheric deposition and eutrophication.²⁶ Conserving

water and using environment-friendly cleaning products are most basic way to stop contributing to water pollution.

There are also soil pollution, it is the same contamination on a different medium. Soil pollution have generally result from over using of fertilizers, also arises from the spilling or leaking of waste into the ground, such as an oil spill, or seepage from a landfill.²⁷

In the light of these information, one can understand the importance of recycling in a better way. In the next chapter Importance of recycling would be explained in detail.

Importance of Recycling

Since the beginning, the world that we live in had a unique balance. Every material particle would be used again in its natural order. All the living things came into being from materials of the world and after they die they disintegrate and fertile the ground for new living things to be formed. Hence, this life cycle can be considered as a giant recycling loop by itself. This balance can resist disturbances until some point, but unfortunately human beings are forcing that resist up to its final limits. One cannot help but wonder, “What can be the worst possible result?”

In fact, the answer is obvious, recycling and reusing should be promoted, and most importantly, the waste created by human beings should be reduced. Since it is an excellent easy way of conserving environment and saving energy that every household can manage, recycling becomes very important. On the other hand, up to 60% of total rubbish can be recycled.¹

The organization of World Recycling argues that they can recycle all kinds of scrap metal ranging from copper, aluminum, stainless steel, brass, battery, steel and more.²⁸ World Recycling organization determines five facts about recycling:

1. “Recycling one ton of paper saves 17 trees and 3000 gallons of water.

2. Recycling one aluminum can saves enough energy to keep a 100-watt bulb burning for almost four hours or run your television for three hours.

3. Improper disposal of e-waste creates a significant burden on landfills because toxic substances can leach into the soil and groundwater.

4. Plastic bottles take 700 years before they begin to decompose in a landfill.

5. Recycling steel saves 75 percent of the energy that would be used to create steel from raw materials, enough to power 18 million homes.”²⁸

In addition to that, it is widely known that there are other methods to prevent environment such as burying or burning. Depending on an international study, which is a comparison of more than 180 municipal waste management systems, it is argued “recycling proved better for the environment than burying or burning waste in 83 percent of the cases.”²⁹

As mentioned before, sustainability of world resources is a very important issue and recycling conserves world resources like wood, water, metals and other minerals. Without recycling it is not very possible to carry on the world’s main features to the next generations. If the ultimate instinct of all of us to make sure of our species continuity then it is our generation's responsibility to heal the damage of industrial civilization and we can start by being more concerned, conscious consumers.

As individuals our affect on most of the global issues seems very little but lets do not forget that, there are more than seven billion individuals on this planet. At this point, it is necessary to look at the case in Turkey, to understand how much we damage on earth.

There is not any nuclear power station in Turkey yet. Building certain stations are still in progress of planning. In order to stop these plans, there are a lot of social campaigns executed by the non-profit organizations in Turkey, and Greenpeace Turkey is one of the distinguished.

At this point, it is necessary to highlight the Chernobyl Disaster on April 26, 1986 in the former Soviet Union and its impacts on mainly Ukraine, Belarus and Russia, and extension to the European continent from Scandinavia to the Mediterranean and in Asia.

It is widely known that the North of Turkey has deeply affected from the Chernobyl Disaster as well. The statistics about the cancer patients marks that there is

an increase and also the age of the patients become youthful. In addition to that, since there is not any properly completed report on the impact in Turkey, it is not possible to make any provision.

At this point, it is possible to state that nuclear power stations are in planning process, but regarding to the non-profit organizations' campaigns, like Greenpeace, Turkish public started raising awareness. A research conducted by Greenpeace Turkey determines that Turkish public doesn't want to have nuclear power stations and they trust to media and NGOs, instead of the government.³⁰

On the other hand, in the case of recycling, Turkey needs more progress. Recently, certain local municipalities started campaigns to promote recycling papers, cardboards, clothes, and also computer parts. Among all, Kadıköy Municipality in İstanbul is distinguished and composing a good example, as they developed a "Waste Coordination Center" and certain policies.³² In addition, Kadıköy Municipality has forbid the use of plastic bags, and started to encourage the use of fabric bags.³³

Besides local municipalities, it is possible to come across with particular campaigns on recycling and Sabancı University CIP (Civil Involvement Projects) executes one of them. In this project, housewives are making bags from waste materials. Hence, waste materials are recycling and also housewives can have their own income.

Consequently, Turkey has a lot to do to ameliorate recycling. First, each district should have particular garbage bins that people can separate their rubbish in glass, plastics, metals and papers. Then, social recycling campaigns should be developed and awareness should be created. At this point, it is possible to affirm that this study would be a part of these social campaigns by highlighting the threats on world nature and the importance of recycling through a video, which is composed of interesting and uncommon elements like origami. Hence, in the next chapter the history of origami and its different types will be discussed.

Origami as a Traditional Art of Paper Folding

It is obvious that everybody have created and played with paper folded planes or ships during their childhood period. The deeds of that planes and ships go back to seventh century. Origami word comes from Japanese words *oru* (to fold) and *kami* (paper) and means “folding paper” that had been adopted into English and many other languages.³⁴ As The Japanese word origami and the English word paper folding means exactly the same thing, *The Origami* has a special meaning in Japanese culture.

There are certain ambiguities in the history of origami. Due to the quality of paper, the first examples of origami and most parts of the written records have vanished. Hence, today, it is unknown whether origami first started in the Ancient Japan or the Ancient China.³⁵ Some historians suggest that Ts'ai Lun of China invented the paper in A.D. 105 and paper folding must have been invented soon after that. In fact, it is clear that paper came to Japan with the Buddhist monk Dokyo in A.D 610, and over the 1000 years of experience tradition of “origami” slowly evolved.³⁴ Although we cannot definitely know the origin of origami, it is not possible to argue that Japanese people fully developed the paper folding as an exceptional art form. Indeed, paper was an expensive material in Japan and used widely in Japanese life, mostly in architecture. Therefore, only rich people could have afforded material for origami.

History of Origami

In the beginning, origami was developed for ceremonial purposes, largely concerned with folding of wrappers, known as 'tsutmi' or 'noshi', which were used to contain and decorate gifts and offerings regarding religious festivals. This tradition still continues for some gift wrappings in Japan today.³⁴ The intelligence of origami was passed through generations mostly in oral. Since nothing could be written down, only the simplest designs were kept.³⁷ Eventually, this ceremonial type of paper folding gave rise to a folk tradition of folding paper into simple representational and practical

designs, such as well known crane (tsuru), the man servant (yakkosan) and the masu box. In 1728, traditional foldings were collected into the Go-hyaku Oribako or known as “Box of 500 folds”. Unfortunately, the folds themselves got lost due to degrading nature of paper; hence, we do not have any information which designs were included in the collection.³⁴

The first written documentation of origami is “Folding of 1000 Cranes (by Senbazuru Orikata)” and was published in 1797. In fact, the name of the book is not coincidence, since the crane is a sacred bird in Japanese culture and it is believed that one wish of the person who folded 1000 cranes would be granted. It is mostly a hope for sick people to get well soon. The next publication on origami exists in “Kayaragusa”, which is an encyclopedia about Japanese traditions and culture, and includes a collection of traditional Japanese figures. In addition, the name “origami” was formed in 1880, before that time it was called “orikata” which means folded shapes.³⁶

In addition, it is argued that there are similar paper folding traditions in other regions, such as China and Western Europe, especially in Spain. In fact, since there is lack of information, it is difficult to support this claim. As it is argued, Chinese paper folding is largely considered as ceremonial, mainly concerned of items to be burned at funerals (mainly “yuan bao”, which means gold nuggets, shaped as a representation of a ship). Moreover, the Western European roots of paper folding is generally based around the folding baptismal certificates, while the bird “pajarita”, the traditional dart, and the Newspaper Hat compose good examples.³⁷

The intelligence of the modern origami was established in 1950 by the famous origami Master Akira Yoshizawa, who died 2005 at the age of 94 and still regarded as the grandmaster of origami, and his fellow Sam Randlett. They published several books with completely new origami models and also developed standardized origami symbols sets, which are still in use today.³⁸

In Western society, other than people who have an interest in the subject as a hobby or profession, paper folding is generally a children activity, which is executed in elementary schools. Christine Petrell, who has been a professional storyteller and author focused on storigami, argues “watching and listening to stories illustrated by the progressive folds of origami models enables students to imagine the visual details of the scenes and characters described by the words, but also give students experience with

analyzing the symbolic representation of paper shapes and folds that are paired with story characters or actions”.³⁹

Since this study aims to highlight the threats on earth and the importance of recycling through animations and posters prepared by origami, it is important to interpret the history of origami, which presents that a paper is not just a paper, historically it is part of an art object. First, it was expensive and accessible only for rich people and that limited its utilization area; then, it became an ordinary material in everyday life, since massive amounts of paper was produced by destroying forest which threatens the future of world nature. Against the destruction of forest, it is important to recycle wasted papers.

In the present day, there are thousands of origami books, and many different styles and techniques, such as complex origami, mathematical origami, modular origami, wet folding origami and more.³⁸ In the next chapter, the different types of origami will be explained in details and the origami types used in this study will be presented.

Origami types

It is obvious that there is not one and unique style of origami. Moreover, David Mitchell, who set a family tree of origami, argues that origami style depends on intention. The purpose of the paper folding determines the fundamental technique. Indeed, the total number of origami types is under discussion.

This study is mainly based on craft origami, since origami is simply perceived as craft. In details, the origami types used in this study can be categorized as following; model making (bird, tree, etc.), play origami (paper, plane, etc.), performance origami (water balloon, etc.), and everyday origami (island, etc.). In addition to these models, it is quite possible to categorize cranes as ceremonial origami regarding its perception in the history of origami. Even though all origami models are in different style, each model is representative itself.

At this point, it is necessary to explain the different origami types in order to emphasize the models and their roles that they represent. David Mitchell categorizes

origami types in nineteen and sets a family tree of origami types and ones which are used in the project will be explained shortly:

“Everyday origami is paper folding which serves a practical everyday purpose and which forms part of the general culture of a society as a whole rather than the special culture of the origami community.

Craft origami is what most people would think of when they hear the word origami. Craft origami embraces both the process of creating designs that are intended to be reproducible and the process of reproducing them from personal or recorded tuition, from diagrams, or by reverse-engineering.

Representational origami is a form of craft origami which seeks to represent objects and living beings in a recognisable way

Play origami is a form of craft origami concerned with the realisation of paperfolds which can function as manipulative novelties or toys. Many traditional paperfolds - including the Flapping Bird - fall into this category.

Model-making origami seeks to model plants, living creatures, or inanimate objects in folded paper.”⁴⁰

Conclusion

In the present day, human beings are so passionate about their demands that they do not care or even are not aware of their damage on earth while consuming world resources. The most important objective of this paper and this project is to get children attention to our probably the most important problems of the century we are living in, like global warming, air and water pollution, destruction of the living space, extinction of the species and unplanned urbanization and raise a conscious around children. If this project and paper can make anybody conscious about those problems the main aim would be met. As a visual designer and conscious individual, it is one of my duties to highlight the dark future ahead of us for the next generations.

As a second objective, this study aims to contribute to still evolving ancient paper art, origami. In this perspective, I have created new folding models like “factory”, “power plant” and “oil well” during this study and it is fascinating to introduce them.

Origami has been chosen as a method for 3d animation project, since it is the perfect candidate to catch public attention while people are familiar with the situation of paper waste and the importance of paper recycling. During creation process, I generally tried to use “the cutest” models in scenes like penguins or elephants, other than models like traditional crane. Toy-like structures of the characters and the struggles they met would have a good chance to support the messages and ideas given through this study. Giving the message by narration and typography with the help of the sympathy for the characters would ensure the pass of information to the audience. Telling about impacts of energy consumption and wasting of world resources and pollution is crucially important to ensure our future on this planet.

In addition, it was essential to set the right target group regarding not to waste time and labor through working on a not interested group. Since the children are the future, I decided to define my target group as children. In the beginning, the target age group was between 12-15, since during adolescence lots of transformations both physically and emotionally were experienced; thriving on arguments and discussions, increasing of memorization ability, thinking logically about concepts; engagement in introspection and probing into own thinking.

In order to check my target group, I conducted two interview; first, with children psychologist Ercan Eroğlu, a member of Istanbul University Çapa Medical Faculty Child Psychology Department, and second, with Selen Ayas, a member of Bakırköy Court-House.

In the light of the interviews I have changed the target group to 7-12, since Dr. Eroğlu point out that attention of children in the adolescence period focuses idolization while it is easier to catch younger children's attention through cute cartoons and familiar melodies from soundtracks of cartoons and games. In addition, Dr. Ayas suggested that a woman narrator could reminiscent of their mothers voice and can arouse sympathy and mercy but worry too. A male narration could become more didactic.

This project aimed to create a public awareness for the problems of the world and to ensure that targeted the future generations. Problems shown through animation videos while the solutions find its place through print out posters. It is aimed to create an uncommon visual and presentation style with interaction. All this work was done for children to realize they need to act for world they will be living in.

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