



The Role of Climate Fiction Movies and Documentaries in Development of Awareness and Critical Thinking of Planning and Design Students

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ABSTRACT

Inspiration of heated debate on climate change motivates film makers to produce climate fiction (cli-fi) movies. It is important to assess whether cli-fi dystopian movies and documentaries are successful in creating awareness of moviegoers about hazards and risks of tomorrow's world. In particular, argument of the study focuses on understanding motivational capacity of dystopian cli-fi movies and documentaries on future professionals who are expected to design and implement resilient urban environments. Planning, design and construction department undergraduate students are the focus group of this study. The data is collected from a questionnaire technique with students in order to support the argument of the research. The questionnaire evaluates behavioural change of students particularly after watching cli-fi movies and documentaries. Questions seek out how their personal and/or professional perspectives have changed following their experiences with climate change related fiction movies and documentaries. Finally, the research argues how the dystopian cli-fi movies could be used as an effective tool to evoke professionals' perspectives in creating sustainable, resilient and climate adaptive environmental conditions.

Keywords: dystopian cli-fi movies and documentaries, climate change, awareness of planning and design students, built environment

İklim Kurgu Filmlerinin ve Belgesellerinin Planlama ve Tasarım ğrencilerinin Farkındalık ve Eleştirel Düşünmelerini Geliştirmedeki Rolü

ÖZET

İklim deęişikliği konusundaki sıcak tartışmalardan ilham almak film yapımcılarını iklim kurgu (cli-fi) filmleri üretmeye motive etmektedir. Distopik iklim kurgu filmlerinin ve belgesellerinin yarının dünyasının tehlikeleri ve riskleri hakkında sinemaseverlerin farkındalığını yaratmada başarılı olup olmadığını deęerlendirmek önemlidir. Özellikle, çalışmanın argümanı, dirençli kentsel ortamlar tasarlaması ve uygulaması beklenen gelecekteki profesyoneller üzerinde distopik iklim kurgu filmlerinin ve belgesellerinin motivasyon kapasitesini anlamaya odaklanmaktadır. Planlama, tasarım ve inşaat bölümü lisans öğrencileri bu çalışmanın odak grubudur. Çalışmanın argümanını desteklemeye yönelik olarak öğrencilerle anket teknięi kullanılarak veriler toplanmıştır. Anket, özellikle iklim kurgu filmleri ve belgeselleri izledikten sonra öğrencilerin davranış deęişimlerini deęerlendirmektedir. Sorular, iklim deęişikliği ile ilgili kurgu filmleri ve belgesellerle ilgili deneyimlerinden sonra kişisel ve/veya profesyonel bakış açılarının nasıl deęiştiğini araştırmaktadır. Son olarak, araştırma, distopik iklim kurgu filmlerin profesyonellerin sürdürülebilir, dirençli ve iklime uyumlu çevresel koşullar yaratma perspektiflerini harekete geçirmek için nasıl etkili bir araç olarak kullanılabileceğini tartışmaktadır.

Anahtar Kelimeler: distopik iklim kurgu filmleri ve belgeselleri, iklim deęişikliği, planlama ve tasarım öğrencilerinin farkındalıkları, yapılı çevre



"Look deep into nature, and then you will understand everything better" Albert Einstein

1. INTRODUCTION OR MAY BE THE END OF EVERYTHING!

Will the earth stand still or the life on earth will vanish? Activities of human race on earth have provoked this type of questions for more than a century due to increasing and widening effects of industrialisation and mostly uncontrolled urban growth all over the world. Scientists have been drawing attention on and philosophers have criticised about damaging actions of people on natural environment and sources. Modernization has been the focal point of those critics which is asserted as the catalyst in alienation of modern humans from nature (Bergthaller, 2012). Literature has produced critical views on modern way of life and urbanization practices all of which mostly accepted as heavily consumption experiences by the 19th century in different perspectives. Air-pollution, insufficient infrastructures and unhealthy built environmental conditions which are triggered by congestion in urban areas have raised the issue of sustainable development. Moreover, global warming and global climate change concerns in recent decades have increased the tension on the future of life on earth. Utopian literature on new living environments is one of very productive approach which generates utopic states in non-existent lands for centuries most of which were brought out on passion of better life and order of communities. Utopias have many critical views on life styles of people, economical activities, judicial system, governmental organizations etc. On the other hand, utopic approaches have taken into account of green built environmental areas which unified constructed environment and natural environment within the settlements. Utopian view generates a good and non-existent land in which people live in equitable conditions and peace with nature without destroying the sources of future generations. However, dystopia which is also accepted as the anti-thesis of utopia generates a black future for the human settlements and human life in an unknown future. Dystopian approach about the future of human race has become a very important tool within the popular culture products, particularly following 1950s. Film industry is the foremost among them which produces very striking, catchy and transformative stories particularly depending on the extinction risk of human race following climate change impacts. Post-apocalyptic images of the films produced by mostly Hollywood industry also disseminates the message through dystopian films that if the human being does not take the necessary precautions and mitigate the climate change affects instantly, it will be too late to survive life on earth, we will lose every single living thing!

2. "WHAT WE EAT ... IS ... PEOPLE!": A SHORT BACKGROUND

The title of this part is converted from a popular catchword of the movie, *Soylent Green*, which was directed by Richard Fleischer in 1973. The original catchword is "Soylent Green ... is ...people!" which mentions the magical word that gives the name to the movie as well. The film, in general, focused on the hunger problem of human race due to rapidly exhausted food sources, disrupted environment, and polluted water sources. The movie starts with the pictures from firstly peaceful life with nature on earth, and then industrialized cities, smoking fabric chimneys, polluted environment, wars etc. As a result, human race have the only chance to survive with a food which is called soylent green in the future. However, a police detective explores and find out that raw material of the soylent green is in fact human flesh. This movie gives a message that if the techno-industrial system and capitalist approach continue to consume limitlessly, the future generations cannot find anything to eat on earth, and may be they have to eat their own race. *Soylent Green* is accepted as the initial approach of popular culture to the environmental concerns pertaining from rapidly and uncontrolled growing of population and urban environments which have been damaging the natural sources and affecting the climate as well (Yaslıkaya, 2015). Lipschutz's environmental and anti-neoliberal perspective on the *Soylent Green* is depicting the dystopian view for today's society as well (Lipschutz, 2006). Lipschutz (2006) stresses that;

"Today, under a global regime of neoliberal accumulation, the body is, more than ever, a focus of simultaneous production and consumption.



What people consume today is not only that which has been acquired through their physical and intellectual labour in return for wages but also the body itself. To create ourselves, we must consume ourselves."

A dystopian approach which is parallel to environmental concerns in cinema industry has generated by the 1970s particularly by the Hollywood. World has been more interested on environment issues by the 1970s and this attention has also supported environment and nuclear war concerned stories to carry over the theatres through dystopian movies. The Day After (1983), Planet of Apes (1968-1970) Series, Mad Max (1979), The China Syndrome (1979) could be regarded as the popular ones most of which produced a post-apocalyptic world and struggle of living of human race or remainders. The built environment and the cities we know have been destroyed, the human civilization has ended, the technology and industrialized nations are extinct, and the life has started from the beginning like in the Stone Age. The political environment, stresses and debates on nuclear powers of nations were used to develop dystopian perspectives and stories on the future of the human being through movies. The filmgoers had a great interest on these types of films and their box office grosses were satisfying enough.

By the 1990s, this time dystopian view has turned the face from general environmental issues to a more specific one, on to the climate change related stories. According to Deaton (2018), although climate change is seen as the most urgent issue of our time, it is very difficult to develop a villain for this story in film industry. Deaton (2018) expresses these ideas as follows:

"There is no masked villain lurking behind the rise in temperature—we are all, to varying degrees, part of the problem. Climate change is also slow, driving up the temperature by a couple of tenths of a degree each decade. There is no Death Star waiting to vaporize our planet at the push of a button. Lastly, while climate change is a profoundly moral issue, it does not stir moral outrage like a legion of space Nazis bent on galactic domination."

The film industry has overcome this problematic issue related to generating climate change story, and produced striking stories with shocking visual effects through cli-fi dystopian movies. Water World (1995), The Day After Tomorrow (2004), Interstellar (2014), Mad Max - Fury Road (2015), and Geostorm (2017) are the fictional movies which have stories starting with environmental degradation and rapid collapse of earth's natural and physical systems due to global climate disasters and climate change impacts. Although climate change affects are accepted as slow onset disaster impacts such as increasing temperatures, increasing sea-levels, changing precipitation usual, treating sudden rains which turn into urban floods, heat waves and heat islands, drought, increasing food security etc., the cli-fi movies bring out the impacts very quickly like in the movie of The Day After Tomorrow. Climate scientists and many have been criticising these kinds of stories, and draw attention to the risks that extreme stories and visual effects may cause apathy among many filmgoers, and motivate them in reverse to a more fatalist approach.

According to Rose, although dystopian movies may see as having difficulties in appealing to audiences, they have been drawing great interest particularly in recent decades (Rose, 2017). Rose explains the popularity of particularly post-apocalyptic cli-fi movies such as The Hunger Games, Planet of the Apes, Divergent and a Blade Runner sequel through their dystopian future functions. They reveal our fears from not tomorrow but even today because we are going to an ending or extinction because of our actions which destroy entire planet, and the message is very clear; prepare your soylent green or you will eat each other.

Özcan (2017) asserts that when the film industry was having difficulties to develop new ideas, and stories, they invented a new scenario, a global ending, which generated a new

and inspiring genre for the humankind. Al Gore who defeated in the presidential election against George W. Bush in 2000, had been using a political discourse of climate change. Following his defeat, Al Gore has started to give talks on climate change issue all over the country and in some other countries as well. At the end, he developed his ideas in a documentary movie, *An Inconvenient Truth* (AIT) of 2006, which made him more popular than his White House candidacy. This film became the second most watched documentary in the US's history, and has made the climate change concept one of the most trending topic in the world. The International Panel on Climate Change (IPCC) which was developed in 1988, and the studies of scientists in climate change issues have been benefitted from the popularity of the concept with the great help of AIT Documentary (Özcan, 2017).

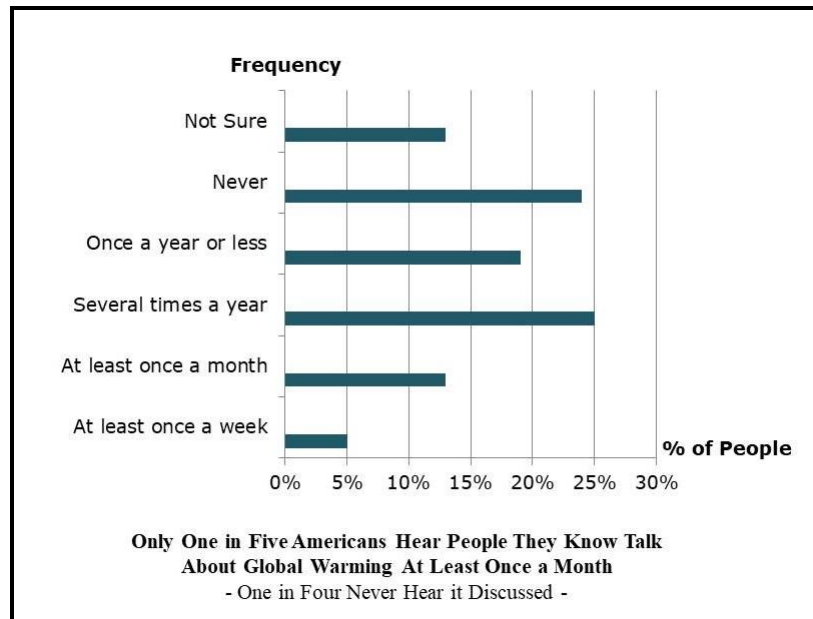


Figure 1. A research conducted by Yale/George Mason University (Deaton, 2018)

On the other hand, Deaton (2018) stresses that the motivation of people in the US is still very insufficient. According to Deaton (2018), people generally do not prefer to talk about the climate change issue enough (Figure 1), although heat waves, storms and wildfires have been accelerating and damaging both the natural and built environment, harassing ordinary people's life much more than ever among the country. Deaton (2018) is bounding this lack of motivation to the deficiency and failure of media including news which do not correlate strong clues of climate change to the disaster impacts. Therefore, "the issue insufficiently penetrates the public consciousness" (Deaton, 2018). The first visual image or the picture which was effective than thousands of words related to the global warming and climate change was about a polar bear who was waiting death on a floating ice piece (Figure 2).



Figure 2. Floating ice piece with the polar bear, a result of global warming (Will, 2017)



On the other hand, the understanding of global warming and climate change impacts which is summarised with the very touching picture of polar bear has been revealed that it is much more than this visualization. It is the problem and despair of human race that needs to change production and consumption methods radically (Özcan, 2017). Irresistible attraction of ending world story has produced the new genre among the film industry which is called cli-fi, the relative of somehow science-fiction. When it is talked about cli-fi movie approach which mainly depends on the dystopian perspective, it is not only a physical destruction of built environment but a moral downfall of human being is concerned. Particularly, the dystopian future view in cli-fi movies draw a future in which filmgoers have the chance to observe and experience the physical and moral transformation of people or survivors.

Epley (2012) moves on the movie, *The Day After Tomorrow* (TDAT) to continue the discussion about the usefulness of cli-fi dystopian movie on people's behavioural change, but particularly on the message about the results of politicians' denial of climate change issue. According to Epley (2012), "TDAT brought the fear of what might result from ignoring the environmental changes to the forefront", and this fear has important effect of changing the approach on to green movements both personally and politically. Epley (2012) concludes that;

"Because of films like Cast Away and The Day After Tomorrow people have become more active in engaging these issues, rather than just letting the politicians handle them or taking life for granted. Overall, action is one very powerful effect of what film can do. It serves as both a reflection on what was, and a crystal ball which reveals what might come next in the grand scheme of things."

On the other hand, Greitemeyer (2013) asserts that although the cli-fi dystopian films have great influence on filmgoers and attract people's attention very much than many other popular culture tools produced for climate change, they are not very effective on people's environmental concerns, unexpectedly. Greitemeyer (2013) bounds this view to the endorsement of most participants' strong belief that warming is occurring and it is caused by human activities, that means there is little role for cli-fi movies to have an impact on filmgoers' behavioural preferences. Manzo (2017) depicts a similar approach that usefulness of a movie cannot be evaluated through its genre. In a similar way, scientific accuracy of a movie is not also the determining factor to evaluate its usefulness. According to Manzo (2017), the usefulness of the movie depends on two issues, significance and consequence. It is not always possible to bound them simply as a matter of scientific knowledge, but they are more than this. Manzo (2017) asserts that in order to understand and evaluate the usefulness, some other values are needed to be evaluated such as "aims and objectives (e.g. raising awareness), social values (e.g. sustainability), and the different functions of climate change communication, notably affect and behavioural change". Manzo (2017) also draws attention on the effectiveness of dystopian films which generates a black future and ending life on earth through their fear-based campaigns and appeals. These can be problematic due to their sometimes exaggerating visual effects which may result in triggering of denial, apathy, repression, anger and counterproductive defensive behaviours (Manzo, 2017). Howell (2011) confirms a similar fact that if the movie does not go beyond of frightening people, and does not give any clues about what to do and how to do, its efficacy is controversial.

3. SURVEYS EXPLORING PEOPLE'S PERCEPTION AND AWARENESS ON CLIMATE CHANGE THROUGH POPULAR MEDIA AND MOVIES

Nolan (2010) conducted a survey to understand the effect of the documentary movie *An Inconvenient Truth* among moviegoers. The survey participants completed questionnaires before watching the film, after watching the film, and 1 month later watching the film as a follow-up survey. The survey give a clear result that watching the film increased the



knowledge and concern about global warming and, a strong willingness to reduce the greenhouse gases. Interestingly, the second survey which is done 1 month later gave the result that there was a slight increase in knowledge. This was explained by Nolan (2010) as the increased awareness changed the perception and following of more global warming news and other media during this period. According to Nolan (2010), although providing knowledge about the harmful effects and consequences of global warming in general, greenhouse gases in particular result in significant awareness and willingness among people, they cannot transform these into practice or life styles easily. This result reveals the issue that there is more than information needed to transfer knowledge into behaviour of ordinary people.

One of the most popular cli-fi dystopian movies which were used very often as a survey focus in many studies is *The Day After Tomorrow*. Bulfin (2017) and Howell (2011) announce that the movie was used in five different independent and international surveys in order to evaluate its effect upon its audience. According to Howell (2011), one of the studies conducted in the USA, two in the UK, one in the Germany, and one in the Japan. A very common conclusion from these studies was revealed that the effect of movie was very high in raising public awareness of and changing public attitudes to climate change concept. Moreover, Anthony Leiserowits who is a risk perception analyst and the director of the Yale Project on Climate Change states that "The Day After Tomorrow had a significant impact on the climate-change risk perceptions, conceptual models, behavioural intentions, policy priorities, and even voting intentions of moviegoers" in the United States (Bulfin, 2017).

Şen and Özer (2018) conducted a survey on students' awareness and perception of climate change without using cli-fi dystopian movies. Although that survey is not directly related with the focus of this study, it is important to state that survey results revealed a high awareness level among university students. This result is important to evaluate the effectiveness of social media and popular culture, but insufficiency of motivating methods to turn that awareness into attitudes and behaviours of mitigating and risk reduction.

4. METHOD OF THE STUDY

Dystopian view within the film industry has been awakening the concern of ordinary people for decades. Those who prefer to watch dystopian movies mostly wonder how it is screened than what it is screened. The background, acting and the visual effects are highly riveting concepts for the moviegoers in dystopian stories which reflect the end of life and correlatively human race. Film industry perfectly uses fear of people about the end of life on earth following a catastrophic event. Among many different disaster film scenarios, the ones pertain to climate change impacts (cli-fi) which resulted in collapses of all systems and extinction of life on earth have become very popular in recent years

Popularity of climate change-based or climate-fiction (cli-fi) movies and importance of their messages among today's generations are worth to discuss in terms of observing and understanding behavioural change of filmgoers to the climate change risks and mitigation efforts. This study argues the effectiveness and usefulness of cli-fi movies on particularly students who are studying planning, design and construction of built environment in Çanakkale Onsekiz Mart University of Turkey. Main aim of the questionnaire is to evaluate the fluctuation of awareness level of the students particularly after watching cli-fi movies and documentaries mostly which are depending on dystopian scenarios.

A survey was conducted with students most of whom are studying in their first years at the departments of city and regional planning, landscape architecture and civil engineering. The results of this survey is discussed within this paper, and a proposal to implicate into practice of these results is developed in order to change the attitudes, understandings and awareness of the students continuously both in their school and future professional lives. The first and second grade students were selected because the



in the later periods a follow-up survey can be conducted in order to understand the effect of the first survey. Moreover, the results of the survey can be transferred into some climate responsive design courses which will be given in the 3rd and 4th grade students.

Before starting the survey and giving the survey papers to the students, a short informative talk is given to the students about the aim and objective of the survey, and the design of the questionnaire. After giving the survey papers, the questions were read together with the students for once and necessary explanation were made as well. When the students had started to fill the survey, a power-point presentation was started in which movie posters were projected to the students. The film posters are very helpful to remind the audiences about the film content and some very popular scenes within the film.

The survey was conducted among the university students who are studying at Çanakkale Onsekiz Mart University in Turkey. A questionnaire with 22 questions was developed. The questionnaire was firstly sent to a control group composed of academics in different disciplines in order to evaluate the accuracy and validity of the survey. The returns were assessed and necessary corrections were done to the questionnaire. The questionnaire was developed under four main parts. The first five questions ask for evaluation of students' general perception to climate change concept; following four questions (from 6th to 9th questions) ask for the evaluation of students' experiences in terms of selected cli-fi movies and documentaries; following 12 questions (from the 10th to the 21st questions) ask for the evaluation of students' behavioural change after watching the movies; and finally the last question (22nd question) asks for the evaluation of students' major reasons in terms of not watching the selected movies (Table 1).

Table 1. Questionnaire Design

Number of Questions	Parts of the Questionnaire	Name of the Parts According to Evaluation Aim
1 - 5	Part 1	students' general perception to climate change concept
6 - 9	Part 2	students' experiences in terms of selected cli-fi movies and documentaries
10 - 21	Part 3	students' behavioural change after watching the movies
22	Part 4	students' major reasons in terms of not watching the selected movies

The selection process of the movies was done through the highest ranking scores presented in the IMDb lists. IMDb is the abbreviation of the Internet Movie Data Base system which is a very popular and authoritative source for movie, TV and celebrity content, designed to help fans explore the world of movies and shows, decide what to watch according to listed contents, comments, and ranks (IMDb, 2019).

The number of students who participated to the survey is 120. 46 of 120 students are studying at the department of City and Regional Planning, 49 of 120 students are studying at the department of Landscape Architecture, and 25 of 120 students are studying at civil engineering department. The reason to select students from the departments in which the students are trained and educated in planning, design, and construction of built environment is the original side of the study. Dystopian movies generate the built environment under the post-apocalyptic views such as destroyed buildings and structures, abandoned cities etc. Human actions are accepted as the foremost reason of global warming and climate change through uncontrolled urban growth, and consumption of natural sources. Therefore, professionals who plan, design and construct the urban environments are the most responsible people in developing climate responsive built environmental conditions and mitigation plans. It is important to



awaken and educate future professionals of built environment in terms of climate responsive cities and buildings.

5. DISCUSSION OF RESULTS

The first five questions seek to understand and evaluate general approaches and awareness levels of the students to the climate change issue. It is also tried to be evaluated about their general concerns related to participation willing to the activities which raise the awareness on climate change (Table 2). According to results of the questionnaires, a great number of students believe that climate change is a major problem for the future. However, more than half of the students assert that they couldn't access adequate information related to climate change issue. In addition, 82,5% of the students didn't participate to any studies and activities concerning climate change. On the other hand, 64,16% of the students have a big tendency to participate any of the activities which increase their awareness on global climate change.

Table 2. Questions 1 - 5

Evaluation of participants' general perceptions to the climate change concept...	YES (%) (person)	NO (%) (person)	Partially (%) (person)	No Answer (%) (person)
Q1. Is global climate change a threat that the earth is face with?	91,67 % 110	0,83 % 1	7,5 % 9	---
Q2. Do you believe you have enough knowledge about global climate change?	6,67 % 8	25,83 % 31	67,5 % 81	---
Q3. Do you think you can easily access to enough information and resources about global climate change?	41,67 % 50	13,3 % 16	42,5 % 51	2,5 % 3
Q4. Have you participated to any studies before which can develop awareness on global climate change?	10 % 12	82,5 % 99	5 % 6	2,5 % 3
Q5. Do you think to participate any activities in the future that may raise awareness on global climate change?	64,16 % 77	10 % 12	25,83 % 31	0,83 % 1

Question 6 asks to determine the number of students who watched the films given in the list before (Table 3). The question is; *could you please indicate if you have seen the listed movies in the below which belong to different genres (adventure, tension, sci-fi, crime, animation, fantasy etc.)?* This reflects that there is not significant correlation between IMDb ratings and watching ratio of the film.



Table 3. Question 6

Year of the Film	IMDB rating	The Name of the Film	Number of People who watched the film
1973	7,1	Soylent Green	2
1995	6,2	Waterworld	12
1996	6,3	Twister	9
2003	5,5	The Core	7
2004	6,4	The Day After Tomorrow	34
2007	7,3	Sunshine	9
2008	8,4	Wall-E	47
2009	5,8	2012	60
2009	5,2	The Thaw	4
2011	5,9	Hell	21
2012	7,3	Beasts of The Southern Wild	8
2013	5,3	The Colony	42
2013	7,1	Snowpiercer	9
2014	8,6	Interstellar	86
2014	5,9	Young Ones	3
2014	5,8	Into The Storm	13
2015	8,1	Mad Max	47
2017	5,3	Geostorm	25
2019	4,7	IO	15

Question 7 asks to determine the number of students who watched the films given in the list before (Table 4). The question is; *could you please indicate if you have seen the listed documentary movies in the below?*

Table 4. Question 7

Year of the Film	IMDB rating	The Name of the Film	Number of People who watched the film
2006	8,4	Are We Changing Planet Earth?	10
2006	7,4	An Inconvenient Truth	10
2007	7,3	The 11th Hour	9
2007	6,9	Everything's Cool	3
2007	6,8	Great Global Warming Swindle	5
2008	7,1	Katastrofin Aineksia	2
2009	8,6	Home	10
2009	7,3	How To Boil A Frog?	4
2009	7,0	The Age of Stupid	6
2009	6,8	Earth 2100	13
2009	5,9	Evil Just Wrong	2
2010	6,9	Cool It	3
2011	7,3	The Island President	7
2016	8,3	Before The Flood	21

Questions 10 to 12 ask to understand if the students believe that cli-fi movies and documentaries are effective tools for raising public awareness on climate change (Table 5). A great majority of students believe that watching cli-fi films and documentaries as an effective tool to enhance and develop awareness on climate change related concepts.

Table 5. Questions 10-12

«films» ... tool for raising public awareness	YES (%) (person)	NO (%) (person)	Partially (%) (person)
Q10. Do you think <u>cli-fi movies</u> can be used as an effective tool for raising public awareness on global climate change?	82,5 % 99	4,16 % 5	13,3 % 16
Q11. Do you think that <u>documentary films</u> can be used as an effective tool for raising public awareness on global climate change?	81,67 % 98	1,67 % 2	16,67 % 20
Q12. Do you think the <u>films belong to different genres</u> (adventure, tension, sci-fi, crime, animation, fantasy etc.) can be used as an effective tool for raising public awareness on global climate change?	79,16 % 95	2,5 % 3	18,33 % 22



Question 13 is a control question in order to ask if the students have ever watched any films or documentaries related to climate change and its consequences. The question is; *have you ever watched documentary or other genre film(s) based on global climate change and its negative consequences?* The answers are given as follow; 63,3 % (76 students) signed the YES choice, 14.16 % (17 students) signed the NO choice, and whereas 20.83 % (25 students) asserted PARTIALLY. Only 1 student did not give any answer to this question.

Questions from 14 to 16 seek to understand the dystopian future elements generated within the films through built and natural environmental conditions. The correlation is tried to be constructed on the space and human relation in a post-apocalyptic environment (Table 6). Although created environment which is strengthened with special effects in cli-fi films mostly attract attention of moviegoers, those are also necessary to construct a future world view which will be affected by possible climate change impacts. Most of the students share a similar idea and support the effectiveness of environment and other special effects constructed within the cli-fi films in terms of increasing awareness on possible impacts of the climate change.

Table 6. Questions 14-16

«films» ... «built environment»... «climate change»...	YES (%) (person)	NO (%) (person)	Partially (%) (person)	No Answer (%) (person)
Q14. Do you think spatial forms and environments (such as vehicles, buildings, roads, settlements, cities and natural environment) created with in the films you watched are successful in giving an image to the audience about the possible impacts of global climate change?	46,67 % 56	3,3 % 4	46,67% 56	3,3 % 4
Q15. Do the correlation of the elements of place used in the films you watched (such as vehicles, buildings, roads, settlements, cities, and the natural environment) and human life create an idea about the possible effects of global climate change among the audiences?	38,33 % 46	5 % 6	51,67 % 5	5 % 6
Q16. Do you think the human and built/natural environment relation within the films on which the scenarios are developed have the ability to transfer the potential harmful consequences of climate change to the audience from a sufficient awareness view point?	35 % 42	8,3 % 10	52,5 % 63	4,16 % 5

Questions from 17 to 20 try to understand the behavioural change following the experiences of the students with the films they watched (Table 7). Questions seek to evaluate the level of gained awareness and perception of the students in their daily life and academic environment, particularly in their classes. It is also evaluated if there had been any changes which will be transferred to the professional life in the future. Question 20 is evaluated under two tables (Table7 and 8) in order to make the answers more clear about the question. Answers of the students do not give a significant result in order to understand and develop a decision on the behavioural change of moviegoers in their daily life after watching the cli-fi films and documentaries. The results may show that they can understand the threats and possible impacts of the climate change but that information cannot be transformed into behavioural change of students in their daily life easily or effectively.



Table 7. Questions 17-20

*Evaluation of students' behavioral change after watching the film(s)	YES (%) (person)	NO (%) (person)	Partially (%) (person)	No Answer (%) (person)
Q17. Has there been any change in your daily life after the film(s) you watch about the global climate change and its effects?	17,5 % 21	35 % 42	42,5 % 51	5 % 6
Q18. Did you gain awareness of the dangers and risks facing urban areas after watching films based on global climate change?	51,67 % 62	13,3 % 16	30,83 % 37	4,16 % 5
Q19. After watching films about global climate change, has there been any awareness to work on adaptation of urban areas to climate change impacts in your academic life and your future professional life?	36,67 % 44	20 % 24	39,16 % 47	4,16 % 5
Q20. Did the films / documentaries you watch cause changes in your daily life by raising awareness of global climate change?	50 % 60	19,16 % 23	---	30,83 % 37

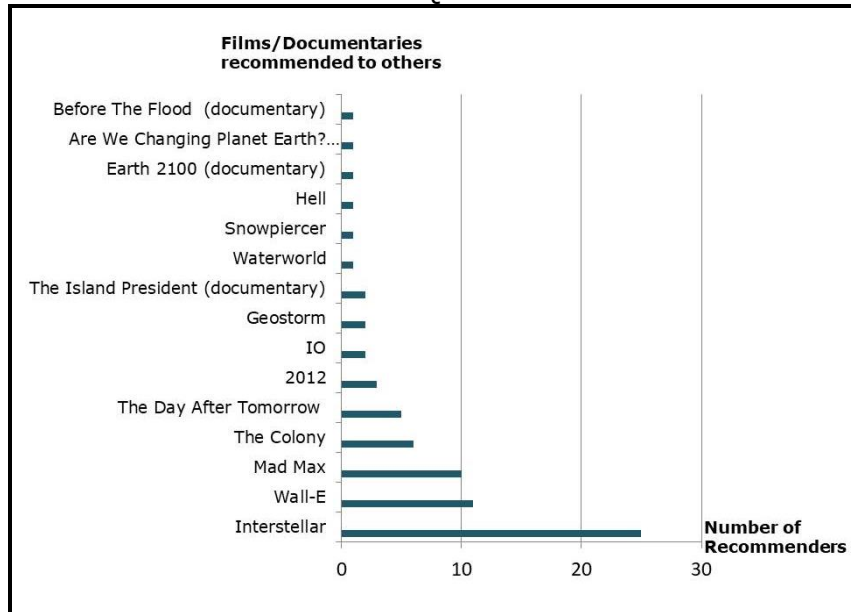
In the question 20, an open-ended question is also directed to the participants in order to evaluate what kind of changes they experienced after watching the films related to global climate change based cli-fi movies and documentaries (Table 8). Different answers were given to the question and these answers were gathered together in the Table 8.

Table 8. Question 20

50% of students informed that there are some changes in daily life after watching these films. These are;	Person
I have been informed about global climate change	18
I gained awareness about heating, electricity and energy use	14
My travel preferences changed, I have started to prefer public transport	11
I have started to inform others about the subject	11
I gained awareness about water use	11
My eating habits have changed and I don't waste any food	8
It was partially changed	7
I've been more sensitive to the environment and living things	5
I am aware of not to pollute the nature and the environment	5
I gained awareness about waste management and recycling	5
I have reduced to use of cosmetic products (deodorant, perfume etc.)	3
I have started to support renewable energy sources, changed my perspective on industrial and thermal power plants	2
I have started to deal with sustainability issues.	1
I have made some activities that are sensitive to the environment	1

The question 21 asks if any of the participants have recommended any of the films given in the lists of cli-fi movies and documentaries within the survey (Table 9).

Table 9. Question 21



The last question (question 22) tries to understand and evaluate the reasons related to missing films given in the lists of which the students have not watched (Table 10).

Table 10. Question 22

Reasons not being able to watch these movies;	Number of Person
I've never heard about the film or I don't know anything about the film	71
I can't find available time to watch a movie	40
I'm not interested in such films	23
I don't like watching movies like this	9
I have no suitable conditions to watch the movies	6
I have no idea how to access the films	3
There is not sufficient advertising about such films	1
I watched different movies about this topic on TV	1
I'm thinking of watching as soon as possible	1
I love these kind of films, I watch whenever I am available	1

6. CONCLUSION

Bulfin (2017) states that popular culture tools such as cli-fi movies are not only passive symbols of the community's distraction, but also "guiding forces: in reflecting concerns, they play reciprocal roles in shaping them, in distorting them, in inflating them and, crucially, in transmitting them to large audiences". Manzo (2017) shares a discussion on the effectiveness of knowledge in climate change, and continues with the opinion that public engagement to climate change responsive actions and mitigation activities cannot be achieved solely with knowing but it is only possible to develop public care through motivation and taking action.

It is clear to claim that cli-fi dystopian movies and documentaries related to climate change and global warming have great influence on awareness to some extent. However, more holistic and integrated models and actions are needed to change the behaviour of the community. As Manzo (2017) discusses the efficacy of the movies, and gives an example of the moviegoers who complained to the researchers in one study that they do



not feel themselves prepared to take an action individually or collectively which may make a difference in practice following watching the movie.

Howell (2011) underlines the importance of effective movie or any other popular culture tool from the point of public structure which is accepted as heterogeneous. Therefore, not only knowledge but some other moral, cultural, economic factors and values are to be known in order to give a variety of accurate messages. Moreover, if the audience or filmgoers feel themselves to be the part of the story within the movie which means sense of personal identification, it appeals to a wide audience (Kick Node, 2019). In other words, "The audience must participate in the news, much as it participates in the drama, by personal identification" (Kick Node, 2019).

The survey conducted at the Çanakkale Onsekiz Mart University among the undergraduate students reveals that a significant amount of participants are aware of the climate change concept and consequences of the issue. The dystopian films and the documentaries related to this issue have slight impact in their life styles. Only 50% of the students asserted that there were some changes in their lives. Films are not the only tool to make significant and constant change in daily life habits. The students who have been trained and educated in developing built environment need more specific and continuing motivation tools which will change their perception and behaviour in their professional life. Design classes are the main courses of these students during their academic life in the school. The social media and popular culture tools such as movies can be integrated with design courses in order to raise the awareness. Moreover, social clubs and design clubs can be generated where climate change issues are discussed, and experiences are shared. If students have the chance to find a platform in which they can discuss and generate different perspectives on climate responsive built environments, they feel more equipped to be motivated and change behaviour. Professionals who deal with built environment such as architects and engineers can be more successful in terms of mitigation and response to the climate risks if only they have gained awareness, knowledge and motivation during their education period. It is also important not to forget that life-long learning models and continuing professional approaches are also very useful mediums to enhance and develop professional awareness in designing and constructing climate responsive environmental conditions.

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