Design Education for Sustainable Human Behavior

Abeer Adel Sayed Mohamed
Decorative Design Department
Faculty of Art Education - Helwan University
Cairo Egypt

Abstract

Graphic design is a design field that has recently become more concerned with environmental and social change and responsibility. As graphic design could be applied and manifested in numerous forms, it could be presented through designing systems, mapping, interface between product and consumer, information about an event, packaging, and more. Design could be described as a "system" where the perspectives of others are included and life cycle is considered (Jedlicka, 2010).

This research examines how design can effectively direct and enhance a community member's sustainable behavior. This paper presents the concept of sustainability and the impact of graphic design practices and products on changing our lifestyle to become more sustainable with more sustainable practices and attitudes as practitioners and consumers as well.

Examples of design for change are also presented in this research. First are academic examples of sustainable design education that reflect design as a learning process and the education process as a tool for change. Second is a professional presentation of design practitioners and websites as design products, including campaigns with responsible and sustainable environmental practices within the graphic design community.

Keywords: Sustainability, Environmental Ethics, Sustainable Behavior, Sustainable Graphic Design

1. Introduction

The word 'sustainable' can apply to any action that does not degrade the natural systems of the earth, which support life and civilization, and therefore can last indefinitely. Earth systems have a consistent and quantifiable level of productivity, which needs a balance between the collective actions of environmental resources during a particular time span to be called a sustainable action.

Graphic design has an enormous and significant impact on society and culture. Designers create visual communication that educates, informs, persuades and inspires the public every day. Designers put a face to our government, institutions, advertising, products and services. Graphic designers thrive on solving communication problems and producing original solutions (Society of Graphic Designers of Canada).

Describing the graphic design product or outcome as a sustainable design can be applied through the design process, selecting materials, subject, or environmental awareness campaign. This paper presents, on one hand, how design can affect cultural practices and human behavior that support sustainability goals for a more sustainable future. On the other hand, it provides a brief history of graphic design and how concerns of design have changed in contemporary design practices, while presenting examples of contemporary graphic design products that focus on changing behavior for a more sustainable culture and attitude.

1.1 Hypothesis

521

Following observations of human behavior and the role of design in changing behaviors, this role should start at the very beginning of young designers' education. Thus, the hypothesis of this research is two-fold, as follows:

- Incorporating sustainability and environmental ethics as a foundation to graphic design education within the design studio curriculum can enhance the traditional learning process that can have an impact on a designer's attitude towards sustainability.
- By understanding the cultural context, design can change behavior starting with design education ending at graphic design practices that influence both designers and users' sustainable practices.

2. Cultures and Sustainability

The First Intergovernmental Conference on Cultural Policies in Europe in Helsinki of 1972 made references to the urgency of formulating the concept of culture that goes beyond reflecting human experiences, traditions, and productions, including its significance as an agency for the transmission and gaining ideas and values (Guzmán, 2013).

Recently, cultural anthropology has become a research field devoted to the analysis of everyday objects and their meanings to people, as has the overlapping field of material culture studies. Miller and Tilley (1996), in the principally anthropological Journal of Material Culture, founded in 1996, focus on interdisciplinary research addressing "the ways in which artifacts are implicated in the construction, maintenance and transformation of social identities". From cultural anthropology, design historians understand that everyday objects have "social lives" (Appadurai, 1986) or "biographies" (Kopytoff, 1986), which shift in status as mass-produced objects are used by individuals and are disseminated and distributed across the globe (Huppatz & Lees-Maffei, 2012). As an example, recall how people behave in the past where there are no mobile phones. Compare this to our daily practices and activities today and the existence and deep involvement of mobile phones in our everyday lives (fig:01).

Fig:01 present how technology can change human lifestyle

3. Environmental Ethics

Environmental ethics on global and regional scale is closely related to development ethics. The Rio Declaration begins, "Human beings are at the center of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature." The United Nations World Commission on Environment and Development declares, "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This applies to agriculture, forestry, water use, pollution levels, industry, resource extraction, urbanization, national policies and strategies. (Rolston, 2003)

Thinking and behaving ethically today means that the interests of each individual, team, organization, and nation cannot count for more than the interests of others because every action has an effect on other people, the climate, and natural environment upon which we all depend for life (Doppelt, 2008).

Today's political, social, and environmental instability suggests a pressing need for the adoption of new ethical codes of behavior. Sustainable ethics play a role here as it is defined as the self-imposition of prohibitions on activities that fail to take into account the impact of our actions on the Earth's sources, things and people, now, and in the future.

Doppelt stated the three ethical principles of decision-making as follows:
1. Ends-based thinking – Do what is best for the greatest number of people.
2. Rule-based thinking - If everyone in the world followed the rule of action I am following, what would be the result?
3. Care-based thinking – Act as I would want others to treat me. (Doppelt, 2008)

4. Sustainable Graphic Design

The idea that graphic design has an environmental concern is not new. In the early 1970s, Victor Papanek argued that the designer is in a powerful position, which helps him or her in creating a better world and has a great contribution to planetary destruction (Papanek, 1973). Therefore, graphic design is a response to communication needs. It appears that the more socialized a country, the more graphic design is associated with cultural and political roles on the side of either propaganda or resistance (Heller, The Education of a Graphic Designer, 2005).

Graphic design has an enormous and significant impact on society and culture. Designers create visual communication that educates, informs, persuades, and inspires the public each day. Designers put a face to our government, institutions, advertising, products, and services. Graphic designers thrive on solving communication problems, meeting tight deadlines, and producing original solutions (Society of Graphic Designers of Canada).

In order to design for change, we need to change the way we design. Designing backwards is a process by which designers take a mental journey, starting from the end of the design project, the end product, and working backwards as follows:

523

waste, user, delivery, warehouse, bindery, printing, until we reach the end in design studio (Dougherty, 2008).

In graphics, green design is a matter of finding and using better physical materials that allow reuse or recycle. Designers might research things such as recycled and tree-free papers, or try to find nontoxic inks, or devise folds and structures that result in less waste. When most designers think of green design, these are the common themes.

5. The Changing Role of Design
Throughout the years, the role of graphic design has faced an enormous change as it adapts in parallel to changes in technology, society, and culture. That role moved from a graphic representation of an idea or belief in the cave age along to a materialistic commercial and advertising role, to more informative and a tool of influencing behavior of individuals.

5.1 The Role of Traditional Graphic Design
William Addison Dwiggins first used the term "graphic design" in 1922, devising it to address issues surrounding the seeming lack of professionalism of commercial art (Meggs, 1998). In particular, the title was meant to signify that his work had gone beyond mere graphic printing and employed professional rules of design and principles of visual styling. However, the applications and circumstance of graphic design have undergone much evolution and change since Dwiggins distinguished graphic design's need for professional recognition. From its beginnings in printing and commercial promotion, graphic design has morphed into a range of specialties, creating new terminology as it changed as diverse as brand mark, communication, identity, interface, and information design (Chou, 2014).

Graphic designers solve visual communication problems. Graphic designers create a visual presentation of an idea, product, and message. The term graphic design can refer to a variety of professional disciplines, which focus on communication and presentation. Each discipline developed its own role accordingly.

5.2 The Role of Contemporary Graphic Design
"In this age of mass production when everything must be planned and designed, design has become the most powerful tool with which man shapes his tools and environments (and, by extension, society and himself). This demands high social and moral responsibility from the designer" (Papanek, 1973).

Dougherty (2008) noted, "design is about effecting change. Someone somewhere is dissatisfied with the way they find things, and they attempt to improve the situation by investing in design. As designers, we are trying to help clients change the way people think and /or the way they act."

In recent years raising awareness among all those involved in the design process of the relationship between design and environment issues, and to demonstrate the significance of the designer's contribution to minimizing environmental problems. The need to build consideration of environmental impact into the design process poses enormous problems and challenges, but also is a stimulus for innovation and

524

creativity. Sustainability and ethics are reshaping the way design is practiced and applied in non-profit organizations and corporate settings (Mackenzie, 1991).

5.3 The Role of Design in Changing Behavior

From a design perspective, an approach to understanding the complexity of everyday objects through analysis of how everyday objects are designed by particular persons in a particular place at a particular time, manufactured under certain conditions using specific materials, and shaped by political, economic and social forces even before they were materialized seems vital in any attempt to implement change for the future (Huppatz & Lees-Maffei, 2012).

In most places, design has not been taught in the context of its social and ecological impact. Many designers assume that their area of responsibility is limited to function and appearance. Until now, designing with environmental impact in mind has been a matter of personal taste or individual moral responsibility. Now it is clear that it will become a commercial imperative. The value and the role of designers will be substantially reduced if they cannot incorporate new concepts and new criteria into their work.

The role of the designers as a link between the manufacturing process and the customer, between the technical and marketing requirements, has given them a central position in many companies in new areas such as product development (Mackenzie, 1991).

6. Design as a Learning Process

In a constantly changing environment, sustainability is a continuous process of learning and adaptation, rather than an ultimate <u>goal</u>. It is a means and not an end. Designing for sustainability not only requires the redesign of our habits, lifestyles, and practices, but also the way we learn and think about design. However, graphic design education must be flexible and responsive. Designers and educators must strengthen the relationships between design and the sciences, between design and business organizations, and between design and the cultural context. According to Dirksen (2012), "designers can get people to hold more information in their heads, or alternately, they can learn better ways to make information available to them in their environment, so they can get it when they need it".

At the beginning of the founding schools of design, there was only one form of education: beaux-arts education in France, which emerged in response to the system and the needs of the state. With the change of the system of values appeared the only alternative approach to formal education before the First World War: Bauhaus education in Germany, which emerged as a result of technological change coming out of the Industrial Revolution. Although these approaches look different, they are in fact based on the same principles regarding the need for attention to the community and the needs of the user, where they focused on the formal aspects of design and architecture, manufacturing technology with little concern for cultural and social issues and values (Salama, 2009).

6.1 Graphic Design Education for a Sustainable Future

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Understanding contrasting values and value systems, behaviors and lifestyles, art and literature, traditions and beliefs inherent in the education for sustainability philosophy are substantial parts of culture that represent the source of the human capability and capacity for sustainable development.

Universities as institutions of higher learning and research are the traditional sites of scientific, social, and cultural knowledge production and a primary employer of scholars and researchers in the humanities, social sciences, and physical and health sciences (Moor, 2009). The art school design programs over the past two decades found it difficult to impose a formula that ensures a solid core curriculum, and a general handbook for how graphic design should be taught and learned, eluding those who have made valiant attempts to quantifiably define it. This paper examines how the convergence of history, theory, practice, and new media could be taught in various educational models. How we learn what we learned? How I teach what I teach? (Heller, 2005)

7. Case Studies and Examples
Examples of design for change will also be presented in this research; first, an analytical pilot study has been made to evaluate how many environmental and sustainable courses are offered within the programs. Also, this section will present academic examples of sustainable design education that reflect design as a learning process and the education process as a tool for change. Second is a professional presentation of design practitioners and websites as design products, including campaigns with responsible and sustainable environmental practices within the graphic design community.

7.1 First: Current Sustainable Design Education Case Study
Recently, sustainability is being integrated in a small scale into the United States as well as Canadian and British institutions' mission and planning, curricula, research, student life, operations and purchasing, and community partnerships and mostly within graduate programs. By providing assignments that focus on solving sustainability problems, educators can engage students, institutions, and the society in turning towards sustainable behavioral and policy norms.

Among graphic design programs that are devoted to integrating sustainability in design education are being offered at higher education institutions around the world. For example, Savannah College of Art and Design offers a master's degree in Sustainable Graphic Design, Minneapolis College of Art and Design offers a Sustainable Design certificate online, and Kingston University in London offers a "Master of Arts" by research in Sustainable Design.

Yvette Perullo (2010) has introduced Sustainability and Ethics in her Graphic Design seminar course at Kingston University in London as part of the MA by Research in Sustainable Design program. Her goal was to teach students to make sustainability the foundation of all their work. This seminar course is an opportunity for students to apply sustainability principles and pragmatic thinking, gaining new insight into the design process and the relationships between humans and nature. Sustainability and Ethics in Graphic Design provides a context for the

consideration of design beyond traditional models of practice. University of Utah's program is another example that features a three-credit hour Sustainable Design Practice course as one of the required courses of the Art History Program with emphasis on graphic design.

7.1.2 Integration of Sustainable Courses within the Undergraduate Graphic Design Curriculum

Universities in North America in USA and Canada has been selected randomly among the most famous graphic design programs to evaluate the curriculum contents and to examine how much the component of sustainable and environmental issues are included within the curriculum of the program.

Canadian universities selected are:

1. Vancouver Island University, Bachelor of Graphic Design program, 120 Credits in four years of study.
2. MacEwan University in Alberta, Design Studies program, 90 credits in three years of study.
3. Simon Fraser University in Vancouver, Interactive Arts and Technology program, 120 credits in four years of study.
4. Ontario College of Art and Design (OCAD) University in Toronto, Graphic Design program, 105 credits in four years of study.

American universities selected are:

1. Minneapolis College of Art and Design (MCAD), Various Graphic Design majors, 120 Credits in four years of study.
2. University of Illinois At Urbana-Champaign, Graphic Design program,122 credit hours in four years of study.
3. The University for Creative Careers (SCAD) in Georgie, Bachelor of Fine Arts in graphic design, 180 Credits in four years of study.

By reviewing the curriculum for the selected programs (Table 01) on the analysis below shows that only one out of seven of the programs introduces sustainable and environmental courses within the program curriculum.

Curriculum content	Design Schools							
	Canada				USA			
	Vancouver Island University	MacEwan University, Alberta	SFU, Simon Fraser, University	OCAD University	MCAD Minneapolis College of Art &Design	University Of Illinois At Urbana-Champaign	SCAD, The University for Creative Careers	
Program Name	Bachelor of Design in Graphic Design 120 Credits	Design Study Diploma 90 Credits	Interactive Arts + Technology 120 Credits	Graphic Design 105 Credits	Graphic design majors 120 Credits	Bachelor of Fine Arts in Graphic Design 122 Credits	B.F.A. in graphic design 180 Credits	
University Requirement	7.5%	6.6%	17.5%	14.4%	7.5%	9%	16.6%	
Introductory & support	12.5%	16.7%	15%	20%	12.5%	16.4%	16%	
Graphic design studios	17.5%	23.3%	17.5%	25.7%	25%	23%	22.2%	
History theory	12.5%	6.7%	15%	8.5%	10%	18%	13.9%	
Technology & profession	15%	20%	7.5%	14.4%	10%	6.6%	10.1%	
CAD & Visual simulation	15%	20%	15%	8.5%	15%	7.4%	10.1%	
Sustainable & environmental	2.5%	0%	0%	0%	0%	0%	0%	1/7 14%
Electives	17.5%	6.7%	12.5%	8.5%	20%	19.6%	11.1%	

\>> Table 01, Comparison of offered courses on the undergraduate graphic design programs

By reviewing universities that offer programs specializing in sustainable and environmental behavior, the study found that the percentage of undergraduate degrees the specialize in this subject is 28.5% of the selected programs, while 14% of design program offer some courses on the topics within the curriculum. This indicates that education is still in the process of involving sustainable courses. However, more involvement and integration are needed to fulfill the needs of environmental behavior for more sustainable future. (Table 02)

Most of the Environmental Design programs focus on the design of expressive and humane interior and architectural space. But, very few programs offer sustainable graphic design programs such as OCAD University in Toronto, Canada, and SCAD in Georgia, USA. Architecture and interior projects are developed in an environmental and societal context. Core design studios focus on research, analysis, design, and presentation. Students learn to transform conceptual ideas into spatial and visual realities. On graphic and commercial design programs, students prepare to pioneer organizational change, technological and material innovation, citizen advocacy, and more as industry leaders. More human, environmental, sustainable development, principles of sustainable materials and services factors are reflected in the curriculum and the courses offered.

	List of sample schools							
	Canada				USA			
	Vancouver Island University	MacEwan University, Alberta	SFU, Simon Fraser, University	OCAD University	MCAD Minneapolis College of Art &Design	University Of Illinois At Urbana-Champaign	SCAD, The University for Creative Careers	
Sustainable/ Environmental Design Program				■			■	28.5 %
Sustainable/ Environmental Design Courses	■							14%

>> Table 02, Comparison shows the percentage of the universities offering either sustainable programs or courses within the curriculum.

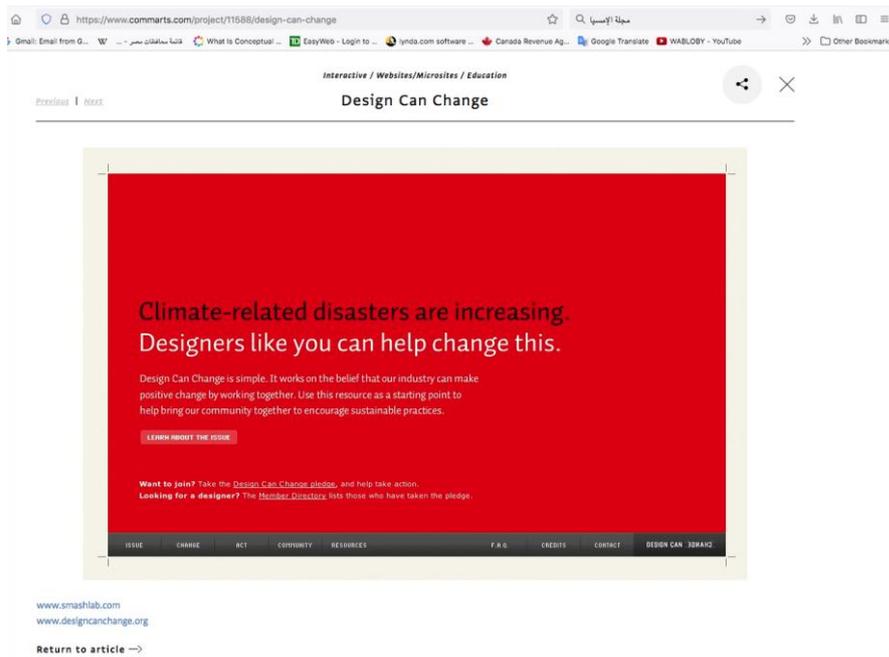## 7.2 Second: Web Project "Design Can Change"

 Fig. 02, Design Can Change Initiative website

7.2.1 Product Description

Design Can Change is a website launched in April 2007 by Canadian studio SmashLAB, a design firm in Vancouver, BC in Canada. This website is a network of graphic designers focused on creating products with the lowest possible carbon footprint. The goal is to positively address climate change, one designer at a time. It is based on an expertise in digital, brand, and advertising. Design Can Change began from a simple idea: if we design things better, we can reduce their negative environmental impact. Since then, it has gone on to start a number of discussions and create real change.

It is one of the first websites dedicated to the graphic designer's relationship to the issues surrounding climate change and one of a few online resources for sustainable graphic design. It is a grassroots campaign and entirely not-for-profit. This site is a response to the fact that sustainability resources for graphic designers are limited, especially in comparison to resources available for related fields such as product design and architecture.

<u>Mission</u>
Design Can Change is a non-commercial initiative. Its main goal and concern is to bring the design community together and make system-wide change to how our work affects the planet. It is a start to raise awareness amongst graphic design professionals to provide a forum for a wide range of environmental problems and knowledge regarding sustainability, such as the Green Paper Guide, a list of paper companies using less chemically treated paper (SmashLAB, 2007).

<u>Objectives</u>
According to the website, the Design Can Change initiative intends to:
- Bring together the design community to leverage our collective strength
- Establish a set of definitive standards that we can all readily implement
- Showcase the work of designers committed to the environment

529

- Promote designers and studios that embrace sustainable practices
- Raise awareness of the importance of sustainable-thinking (SmashLAB, 2007)

7.2.2 The Sustainability Benefits of the Website
The pledge of the initiative is a positive step to encourage designers and buyers of design to adapt sustainable practices. It aims to spread the word amongst the entire design community: sharing knowledge, encouraging a sustainable mindset, making sustainable design resources available, providing information, knowledge, and techniques of sustainable thinking and practices.

1. The Pledge
The initiative focuses on the pledge that asks for a designer's commitment to a set of guidelines that can get the sustainable practice and green mindset to design studio. There are five guidelines that are required from the designer participant:
- Engage the client in the sustainable topic
- Consider their choices carefully
- Put their knowledge to use
- Share information with others
- Unite with the community to stimulate change
Designers who take the pledge are listed in the website's searchable directory of likeminded studios.

2. Sustainable Design Checklist
They have created a sustainable design checklist to keep the designer's project green throughout the design process. The goal is to help designers reach their sustainable goals as much as they can by getting as many check marks as possible. The more the check marks checked, the more sustainable the design is. This method helps designers evaluate their work for future improvement.

3. Green Paper Guide
This guide helps designers to find the most environmental paper options available. They have focused on presenting the data correctly and accurately, however, the designer may want to check directly with the manufacturer, as paper specifications change regularly.

4. Ways to Make a Difference within the Studio
It is a list of things that designers might consider as they move along with the design process to sustainability. The list is not a complete and final list but it can be a motivation to start to get the ball rolling towards change.

7.2.3 The Main Environmental and Social Impacts
Design Can Change gained recognition with the international design community and by May 2008, it had listed the engagement of over 1800 designers in 77 different countries. Since its launch, it has won awards and received mentions on popular design portals, industry publications, and hundreds of blogs and news outlets, such as The Vancouver Sun and The Globe and Mail.

Consequently, Eric Karjaluoto (SmashLAB's Creative Director) has been invited by design associations such as HOW Magazine, AIGA, and New Media BC

(AmeSea Database – ae – April- 2022- 573)

speaking events to present the Design Can Change initiative for a more sustainable future. Also in April 2008, Time Magazine selected Design Can Change for being part of the Design 100. Time's annual Design 100 lists "the people and ideas behind today's most influential design".

The benefits of this website adequately reflect the main issues identified in its content. The sustainability benefits focused on the pledge and the checklist that makes the designer keep track of the progress of the design to assure its sustainable benefits. While the social impact relies on connecting design practitioners in a unified forum that allows designers to discuss their points of view and questions with other professionals in the field on the one hand, and on the other hand for answering clients' questions and inquiries.

7.2.4 The Role of Design in addressing Improvements in the Sustainable Performance of a Product

In Design Can Change's mission, it is mentioned that "we can generate awareness and further the cause to end global warming." This statement could be a misleading statement. This issue has been a debatable topic for many years. One of the examples of this is the question posted on the Debate.com web page: "can global warming be stopped?" 56% of the responses on this question believe that we cannot stop global warming, and 44% believe that we can stop it; each party has its scientific reasons and logical explanation. (Debate.org, 2013)

According to Berman (2013), mentioned in his book "do good design" is that " the graphic designers (some say "communication designers") create a bridge between information and understanding. Designers have an essential social responsibility because design is at the core of the world's largest challenges, and solutions" (Berman, 2013). We live in a designed world. Thus, designers shape what we see, what we use, and what we waste.

Design has enormous power to influence how we engage with our world and how we envision our future. This supports the idea of designers having the ability to make a vast difference, which relies on the fact that designers can influence the clients' decisions of businesses and organizations with a massive advertising budget. Accordingly, a designed presentation of products and services affect the user's behavior and shapes our lifestyle.

This fact puts designers in a very sensitive position that makes it urgent for designers to be transparent and realistic and subjective in presenting problems and solutions. Many researchers and scientists assert that climate change will persist even if emissions became under control, which is an idea prevalent in many studies including a study by Susan Solomon, one of the world's top climate and atmospheric scientists. The study claims, "There is absolutely no way we can stop global warming. The severity of damaging human-induced climate change depends not only on the magnitude of the change but also on the potential for irreversibility."

According to the National Geographic website in the webpage "Global Warming Solutions," "Even if we stopped emitting greenhouse gases (GHGs) today, the

531

(AmeSea Database – ae – April- 2022- 573)

Earth would still warm by another degree Fahrenheit or so. Depending on our choices, scientists predict that the Earth could eventually warm by as little as 2.5 degrees or as much as 10 degrees Fahrenheit" (National Geographic, 1996).

8. Conclusion

Finally, design and cultural researchers and practitioners present the impact of design in shaping culture and social context. Considering the new cultural definition of design as a way for the transmission and acquisition of ideas and values, it is not limited to reflecting human experiences, traditions, and productions. It is clear throughout human history that design products of various design disciplines have a great impact on changing social and cultural settings, which is reflected on changing the behavior of users, designers, and even institutions, companies, education, and overall policies. The role of changing user behavior relies on the message of the graphic design product. That message could transform information or act as a positive behavior recommendation, which is presented in any form of graphic design 'campaign, posters, brochures, and any printed materials, as long as any digital media presentation'. (Figure 03)
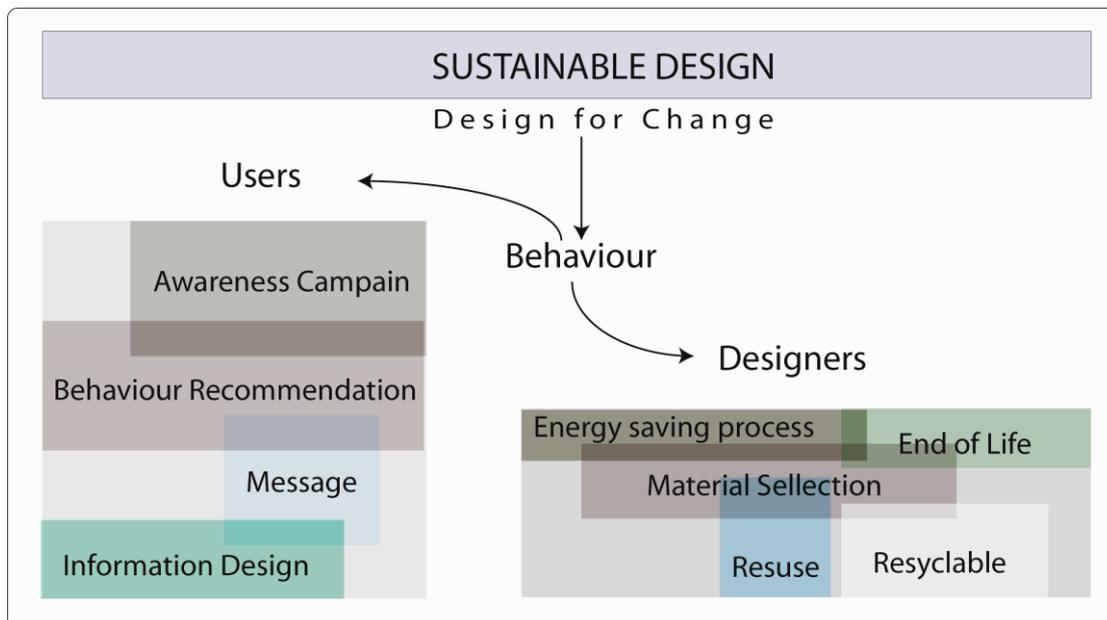
□ Fig. 03 sustainable design and changing behavior of users and designers

As a result of rapid social, technological and environmental change, the rise of the interest in and concern with sustainable issues reflects the changing role of the design and designer. Consequently, sustainability became a major goal and a target practice and attitude of all design stockholders, including design practitioners as well as design educators and design education system. In order to design for change, we need to change the way we design by trying to use less materials and energy with much less ecological footprint. However, the greatest impact of graphic design does not just lie in selecting materials to use or paper and printing and all energy exerted in the design process, but the real impact is the ability to communicate, persuade, and ultimately to change how users act. As Dougherty (2008) said, "being a designer is about being an agent for change. Being

532

a green designer is about being an agent for positive change".
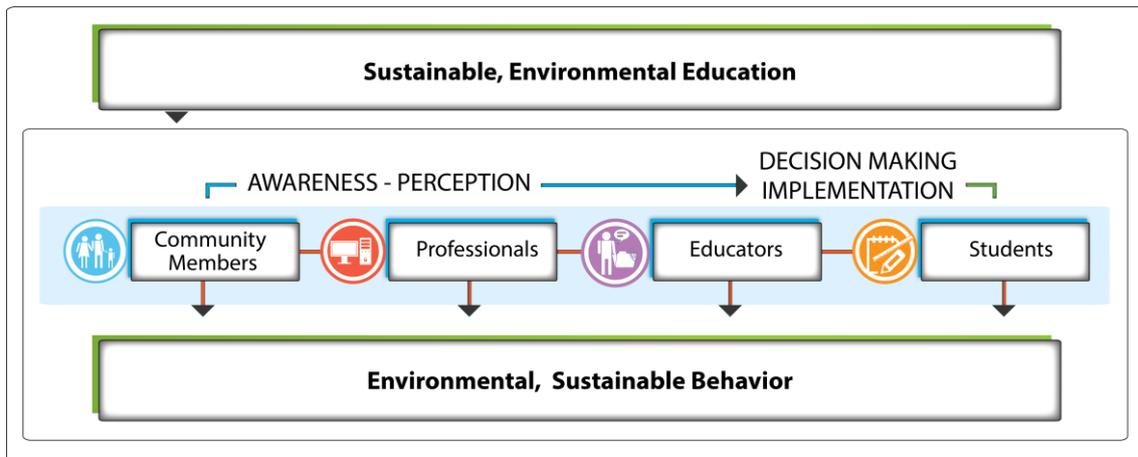
☐ **Fig.** 03 sustainable design and changing behavior of users and designers

Recently sustainable behavior and environmental issues started to be integrated into the design learning process either for under graduates or graduates design programs on one hand or on the other hand in a small scale by individual educators, or in larger scale by universities and institutions curriculum. Thus, education can be an effective tool for changing behavior for all stakeholders of the community, as user or community members, designers as professionals, and design educators as well. This change can be achieved through awareness, and the perception of the environmental problem and human responsibility for making the right decisions for more sustainable behavior for better future. (as it shown in figure 03)

Nevertheless, either for designers or users, the ethical decision is a personal decision. Where each individual decides whether to choose between right and wrong, good or bad. It is his/her choice to do good deeds and take an environmentally responsible decision and environmentally friendly (Green Behavior) behavior that emerged out of his/her conviction of responsibility, which can be influenced by various green and environmental design and design education practices.

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