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Refine the Students' Skills Through Design Education to Create Ethical Products

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Abstract

This article focuses on applying the ethics of the product features during the students' design education. Good/Bad design term is a conventional approach to discuss the ethical/unethical design values of the products. It is noted that different aspects of the product design such as visual information design, interface design, and appearance design have a vital role in judging the levels of ethics in the product. So the students of product design everywhere need to practice the term ethical/unethical design during their study because designers influence society more than they could imagine. This influence can be done by creating an attractive organized appearance and perfect functions that support the ethical brand's image to the customers. The interviews and discussions were held as a research method with the students of product design in some institutions in addition to some design experts and customers to find out their opinions about the design values that achieve the ethical dimensions in the product design. They can end up with products that carry ethical values in their design. The final article's results are in the descending order of the different design values according to their importance in emphasizing the ethical aspects of the products, in addition to a checklist including some important questions that can help the designers to be more aware of ethics' considerations in the product design because ethics is a process of learning, not a process of obedience, and to highlighting the term of ethical designer which in turn reflects on the ethics of customers and societies.

Keywords

ethics, product design, education, good design, bad design, ethical designers

Introduction

Education is the process by which ideas and cognitive experiences can be transferred from one generation to another. In the field of design education, it is an arrangement and planning process that takes place within the human mind of the students to produce the best products for use in daily life (Kunat et al., 2019). The Bauhaus School, which was established in Germany in 1919, is widely held to be the first educational school in the world that prepared a dedicated curriculum to teach various kinds of design. It ultimately transformed design practice from craft to a science. This was the start of several educational schools of design that sprang up all over the world.

In modern life, we live in a world where our everyday objects are designed to enhance our experiences, desires, and emotions (Aranda et al., 2019). The creation of visual communications of products requires the ethical selection and application of methods, media, materials, design elements, and principles, during the education of the design process, where these are the resources of visual language (Slack, 2006; Yildiz & Ozdemir, 2018).

Designers present their different ideas of products in an ethical way to improve the average human's life; indeed, ethics is an important aspect of improving that quality.

In the field of product design, designers face increased challenges in the creation of effective and attractive visual communication of their products. Some of these challenges are related to the ethical aspects of the visual language of the product design (Berman, 2009).

The set of ethics regarding the visual language in product design requires a new view and good application of design values such as simplicity, functionality, the aesthetic, informational content, environment protection, and ease of categorization, all of which represent the construction of the form (Berman, 2009).

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Nowadays, awareness of the terms "good design" and "design for good communication with the consumers" has become part of the ethical and social responsibility of designers. It is noted that there are not enough rules or clear obligations for designers to control and regulate their ethical roles during the design process. Although different design organizations and companies have their legislations and ethical guidelines, which may vary from one to another (Bowles, 2018), the ethical responsibility lies primarily with the designers themselves who practice the design process and determine the formal and functional features of the product (Buwert, 2015).

Therefore, this article aims to clarify the ethical aspects of product design so that designers and students may refine their design skills; it also demonstrates how to apply the different design rules and values to reach an ethical product that subsequently reflects the ethics of customers and society as a whole.

Objectives and Assumptions

This article emphasizes the ethical aspects of product design in terms of the visual appearance and the structural and formal composition of the products through training and motivating the students during their study of product design. If the students put in their consideration the ethical value of good design versus unethical value in bad design, this will help in finding a new generation of ethical designers who can apply the different design basis and rules to reach a good product design which in turn reflects on the ethical behavior of the consumers (Quinn, 2011; Roberts, 2006).

In light of the objectives, the research assumptions can be determined as follows:

- Design values that are related to appearance, aesthetic, informational content, ergonomics, function, easiness of categorization, and so on carry an ethical/unethical role in the product.
- Teaching the product design students; the ethical dimensions of design values will help in forming futuristic designers whose ethical ideas will be reflected in the customers' behaviors.

Literature Review

Different studies have dealt with the subject of ethical/unethical design of the products; some of these studies can be discussed as follows:

2-1-Study of Keitsch and Bjørnstad (2010) under the title "Ethics in product design curriculum: An example from the Oslo School of Architecture and Design" discussed a didactic approach to include ethics in teaching a design course at the Oslo School of Architecture and Design. The study did not focus on the ethical product design itself but on how to integrate an ethical decision on design, its conditions, and implementations in a curriculum (Keitsch & Bjørnstad, 2010).

2-2-Study of Erdönmez and Guneş (2015) under the title "Ethic conscience in product design" which aimed to present the needs and requests of ethical theories in product design from the stage of concepts to the final solution. The conclusions were about the awareness of ethics and the social responsibility of the designers to ensure the products as an ethical leader for everyone (Erdönmez & Guneş, 2015).

2-3-Study of Poepoe (2016) under the title "Ethics of Product Design and Manufacturing" which focused on product design, manufacturing, and the importance of ethical rules during different manufacturing processes to make products with high specifications. The purpose of the study was to make products that are identical to safety and quality factors, having an ethical value to the user and widespread in commercial markets (Poepoe, 2016).

2-4-Study of Buwert (2015) under the title "The ethical potential of design" discussed the concept of ethical design from a philosophical point of view, especially in graphic design and its various derivatives from a theoretical point. This study concluded that ethics as a concept has an impact on society's sense and feeling (Buwert, 2015).

2-5-Criticism of the literature review: It is noted that the previous studies have focused on various aspects of ethics related to the fundamentals of teaching product design in general and the ethical side in different design stages. Moreover, other studies discussed the application of the ethical rules in the manufacturing processes and ordering the team members to follow these ethical instructions; another study has focused on the philosophical aspect of ethics in graphic design. However, none of these studies has focused on the ethical aspect of the product design itself or on teaching the students how to apply the visual language of the product from an ethical view.

The Theoretical Study

Goals of the Users and Retailers via Product Design

According to the American Marketing Association, marketing is "an organizational function and a set of processes for creating, communicating and delivering value to consumers and managing this relationship in ways that benefits the organization and its stakeholders" (Lee & Jin, 2019). Also, marketing refers to all activities that take goods and products from the place of processing and production to the place of sale or consumption.

It is noted that marketing is a compound of a large number of elements, and each one of them is exploited in different ways depending on the type of the product, its age, its marketplace, price point, and target market; the main element in the marketing process is the product and its quality as shown in Figure 1. The product design refers to the relation between form,

Figure 1. Main elements of marketing and their relation to product design.

functions, materials, and so on, and they all depend on the creativity of the product designer and the company's policy.

Ethical marketing is one of the retailers' goals, where ethical marketing includes multiple aspects such as product quality, relevant price, and promotion by using ethical views on the consumer-brand relationship and perceived product quality in business to consumer transactions. So there is a close relationship between the different components of ethical marketing, especially concerning the quality of product design, manufacturing, and price. The consumer has a special view about the quality of the product, which is represented as follows:

- High quality of performance.
- Attractive features of aesthetics, colures, lines, size, and weight.
- Reliability through smart technology and high durability of materials.
- Economical in energy consumption and hard work for long periods.
- Safe during use and does not be harmful.

Previous features that must be provided from the user and seller point of view will be only available in the ethical design that the designers perform during the design process.

Education of Product Design Ethics

Ethics is a branch of philosophy that deals with some values relating to human behavior such as the rightness and wrongness of certain actions and the goodness and badness of the motives. In the field of product design, visual communication is a language that directs people's decisions about how and where they live and what to buy and use (Card, 1999). Moreover, the term visual communication is concerned with the visual information design and the visual appearance of the product itself. So the students need to deal with the product as one unit from a physical and informational view during the design process. It is not easy to separate the visual information which the users get through screens, counters, packaging, signage, logos, labels, instructions, details of ingredients, and so on (Slack, 2006; Yildiz & Ozdemir, 2018) from the appearance language of the product which can be

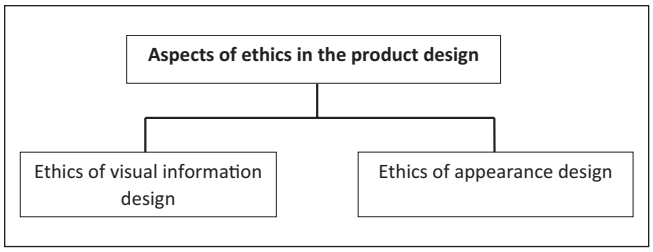


Figure 2. Aspects of ethics in the product design.

read from lines, colors, texture, materials, ergonomics, and so on (Cross, 2018).

In the relationship of ethics to product design, there are some ethical aspects which can be identified as follows:

- Ethics of the visual information design
- Ethics of the appearance design, as is shown in Figure 2.

Ethics of Visual Information Design

Visual information design is concerned with the visual messages in the product design; designers create and communicate through visual means to shape the everyday quality of life for individuals and societies. Visual information design uses images, drawings, digits, typography, and colors as primary components of the visual language to support the conception and visualization of the ideas (Shedroff, 2009; Sherin, 2014).

Designers generate and develop their visual communication of the products (Dent & Sherr, 2015); the design process has a flexible structure to help the designers in organizing the design ideas that are shaped by different considerations of aesthetics, function, social, environmental, and economic values.

Visual information aspects of the product design include the following:

- Images and logos.
- Typography, different instructions, and interfaces.
- Digital illustrations, digital public relations layout, and screens.
- Information graphics, charts, tables, diagrams, and animation.

Ethics of Appearance Design

Regarding the products' appearance, the design should be understandable and meaningful to everyone because consumers must be able to evaluate the product from the side of functional, aesthetic, symbolic, and ergonomic values through communicating with the meaning of the product appearance (Erdönmez & Guneş, 2015). The process of recognizing the meanings of the product appearance can be summarized in two steps:

1. When people ponder at a product appearance, they perceive psychological and informational effects through product features like colors, shapes, textures, lines, and so on. For example, refrigerators' appearance is usually rectangular and has a smooth and shiny white surface (Frascara, 2004).
2. Certain combinations of colors, materials, and other physical aspects of components give the product a look that can be described by a certain appearance attribute. For example, a DVD player that is angular, metallic, and made of a smooth texture is perceived as a modern type.

The consumer's culture is an important determinant of the product's appearance. For example, the meanings of colors, forms, and lines vary from culture to culture as in the United States, Europe, the Middle, the Far East, and so on (Giaretta, 2005).

Research Methodology

Research Design

Based on the objectives of this article, the study was divided into three parts. The first part included a literature review and a theoretical study of ethics and its relation to the product design aspects. In the second part, in light of the theoretical study, interviews and discussions were conducted with the students of product design in different design institutions in addition to some design experts and customers. They were all invited to tell their opinions by answering some questions derived from the theoretical study in this article. The questions addressed the ethical aspects of product design and its relationship to functional, aesthetic, informational, and environmental design values. Conducting such discussions, specifically among the targeted students and experts, plays an important role in creating strong concepts about the ethical product design features and building the designers' personality that will appear among different consumers who will own these products.

In the third part of the study, the multiple answers to the discussions' contents were arranged according to their percentage and importance. It was noted that a high percentage of respondents agreed that the specified design values in this article carry ethical aspects in addition to their other characteristics. The multiple results were compiled and showed that different design values occupy different rates in terms of their relationship to the ethical aspects. Finally, they all were arranged in descending order to direct the students of product design and junior designers to develop their futuristic skills in the ethical frame of product design, in addition to a checklist helping them ethically to think and create their ideas.

Participants

Students of product design and graphic design took part in the interviews and discussions. The total number of the

students was about 50 aged between 18 and 22 years with an approximately equal number of males and females. The used language was English and Arabic. The participants were students from different countries (Jordan, Egypt, etc.) in addition to some designers, design educators, and customers (about 30). The total number of participants was 80.

They all have their concerns about the ethical role of the product design. Moreover, they have their futuristic view of design development through the concept of good design versus bad design.

The Participant's Selection Criterion

The decision to conduct such electronic discussions with students of higher educational institutions in different fields of design (especially Product and Graphic Design) was taken by the fact that students' character at this stage is well formed and they are independent to criticize, assess any of the design topics, as well as they directly will be affected by the results of this study.

Research Instrument

The research used the methods of interviews and electronic discussions with the students, design specialists, and customers who are interested in the research topic.

These qualitative methods allow one to collect not only statistical data but also more details about the participants' opinions. Participants had no restrictions on expressing their opinions and had the opportunity to express their full views. Respondents were asked to answer some of the following questions:

- Is there an ethical role of simplicity in product design?
- Is the aesthetical appearance of a product related to the ethical/unethical design?
- Is the informational content of the products relevant to ethical/unethical design?
- Is it ethical for users to get the function of a product safely and in a comfortably manner?
- Does the ergonomic value have a vital role in the ethics of product design?
- Does the easily categorized product clarify the ethical design?
- Is different industrial companies' private legislation related to product design ethics?

The participants expressed their opinions freely and talked about the expected features of ethics in product design, whether they were from a theoretical or practical view.

Research Issues and Restrictions

The spatial limits of the research were outside the United Arab Emirates, and the participated students in the electronic discussions were from different countries with a variety of cultures to enhance the research objectives. They were in close age stages and from multiple design disciplines such as product design and graphic design.

Data Analysis

The interviews and electronic discussions are related to qualitative research methodology. During this process, all the participants' answers were collected and analyzed; the most common answers were highlighted and compared with each other, and the final results were grouped into consecutive tables with a graph showing the relationships between them.

Results and Discussions

Discussions and questions have taken place around the ethical features of the products, and the approach of good/bad design was chosen as a suitable way of the term ethical product (Hazelton, 2013). Some study cases were presented during the discussions to determine the different design values that realize the product ethics and to form the questions that are directed to the different participants as follows.

The Simplicity Value

Concerning simplicity and information design, the simplicity value makes the appearance and interface of the product easy to read and understand. It means that it is ethically designed. A bad appearance with random information design is shown in Figure 3, and a well-arranged information redesign is shown in Figure 3.

The Informational Content Value

The informational content needs to be honest and to exclude all its false or deceptive information to persuade the consumer (Keitsch & Bjørnstad, 2010). Figure 4 shows some good form design of signage and panels, but they have bad content due to mistakes in data arranging, fonts, illustrations, choices, and so on.

The Functional Value

The functional value was chosen as one of the design values, based on an analysis of some products from the functional view because it is ethically to the consumer to get the function of a product easily and safely, vice versa (Klein, 2002).

The Aesthetical Value

The aesthetical value has its ethical side because it is concerned with emotions, feelings, and pleasure of what is seen, regardless of any physical benefit (Kunat et al., 2019). When some products are similar in functions and price, consumers

Figure 3. Simplicity value in a coffee machine interface, bad design (A) and well arranged (B).

Figure 4. Bad informational content design as an unethical design.

will prefer the ones with the most aesthetical appearance. It is considered a kind of an ethical communication requirement for satisfaction because the design must reflect hope and happiness for the users.

The Ergonomic Value

The ergonomic value requires product compatibility with consumers' capabilities and the human body's measurements (Lee & Jin, 2019). Usage functions can be implemented in a product at a high or low easiness of use. Consumers form an impression about the ease of use, operations, stability, and so on. How the cup holder blocks access to the cassette player and the dashboard of the car is shown in Figure 5A. This mess can be a reason for an accident for the driver and passengers. Another ethical and ergonomic redesign can be noted in Figure 5B.

The Categorization Value

Recognizing the product identity will be easier if it belongs to the same category of the products. However, it will be a mysterious and unethical design when it becomes difficult to be categorized from the first peek. The consumer is not supposed to be confused and to ask what is this product used for? (Lefteri, 2014).

Figure 5. Bad design of cup holder (A) and good redesign (B) as an ethical solution.

Table 1. Relation between Design Values and Their Interpretation of Ethical/Unethical Product Features.

Design values	Ethical product features	Unethical product features
The simplicity value	Arranged, high quality, reduced numbers of components, easy to be read, streamlined lines, etc.	Random, much more quantity, numbers of components, difficult to be read and complicated.
The informational content value	Honest, clear, objective, compatible with the social customs, etc.	Lying, mysterious, nonobjective, conflicted with the community customs.
The functional value	Utilitarian, logical, systematic, durable, stable, etc.	Nonbenefit and atypical appearance, complex, weakened, freed, etc.
The aesthetical value	Emotional, lovely, proportioned, satisfied, joyful, etc.	Senseless, depressed, ugly, etc.
The ergonomic value	Usable, serviceable, logical, perfect of communication.	Bad communication, unusable, difficult to maintain, illogical, etc.
The categorization value	Identified, definite, characteristic, historic, etc.	Nonidentified, ignorant, unknown, indefinite features, etc.
The environmental value	Easy to maintain, new materials, zero emission, healthy, clear, attractive, etc.	Difficult to maintain, traditional materials, polluting, nonhealthy, deceptive, nonattractive, etc.

The Environmental Value

One of the ethical values of the product design is how to make it an environmental-friendly with zero emission (Monteiro, 2017). Nowadays, many synonyms have appeared in the relationship of the product with the environment, such as the green product, friendly product, zero-emission product, eco-design, and so on. There is no doubt that all of them will be ethical products (Poepoe, 2016).

From the previous analysis and discussions, the following table shows the relation between the previous design values in case they are available (ethical) or not available (unethical) in the formal and structural product features.

Table 1 explains the relation between design values and their interpretation into ethical/unethical product features.

During discussions, the coming tasks were achieved as follows:

- Test the previous values;
- Give every value a specific percentage;
- Identify their priority for the users, designers, students, and design educators.

Hence, different design values can be prioritized to the ethical aspects of product design.

Table 2. Percentages of the Ethical Role in Product Design Simplicity.

Evaluation	Frequency	Percentage
Agree	81	81.1
Agree to some extent	15	15.1
Disagree	4	3.8
Total	100	100

Table 3. Percentages of the Aesthetical Value to the Ethical/Unethical Design.

Evaluation	Frequency	Percentage
Agree	83	83.3
Agree to some extent	12	11.7
Disagree	5	5
Total	100	100

Table 4. Percentages of the Informational Content Value to the Ethical/Unethical Design.

Evaluation	Frequency	Percentage
Agree	80	80
Agree to some extent	14	14.3
Disagree	6	5.7
Total	100	100

Discussions contain about 21 questions (some of them were clarified in the part of the research instrument) that were evaluated during structured discussions to ensure its accuracy and suitability for ethics in product design.

Participants of male and female groups of designers, users, students, design educators, and so on have filled out their electronic answers, and some examples of their results are shown as follows:

- The first inquiry was as follows: (Is there an ethical role in product design simplicity?). The results are shown in Table 2.
- The second inquiry was as follows: (Is the aesthetical appearance of the product related to the ethical/unethical design?). Answers are shown in Table 3.
- The third inquiry was as follows: (Is the informational content of the products relevant to the ethical/unethical design?). Answers are shown in Table 4.
- Likewise, all inquiries about the design values and their relation with both ethical/unethical design can be performed in the same way. The following Table 5 shows the final highest percentages of all mentioned design values and their importance to the ethical/unethical product design.

Conclusion

The previous percentages of the design values have revealed its importance in the ethical/unethical design from the view of the design educators, design students, users, and designers. The descending ordering of these values seems as follows:

1. Aesthetical value, 83.3%.
2. Simplicity value, 81.1%
3. Informational content value, 80%.
4. Functional value, 79.9%.
5. Environmental value, 77.8%
6. Ergonomic value, 76.6%.
7. Categorization value, 75.9%.

Also, the previous percentages can be expressed through the following Graph 1:

The previous descending order of design values and their relation to the ethical/unethical importance in products shows that the aesthetic appearance value has obtained 83.3% that confirms its priority for the design students, experts, customers, and so on. It is followed by the value of simplicity of 81.1%, while in the third order, comes the informational content with a rate of 80%. These three values confirm the interests of the questionnaire's participants as an important source for judging product ethics.

The other lower values in the evaluation like the functional value of 79.9%, the environmental value of 77.8%, and ergonomic value of 76.6% indicate that the participants could not evaluate the ethical importance of these values from the first observation and that they need time to test and judge the validity of them. At the end of the categorization, the value comes as 75.9% which means that products are difficult to be categorized in terms of construction, and external features are unethical.

From the previous analysis, the final results of the article can be summarized as follows:

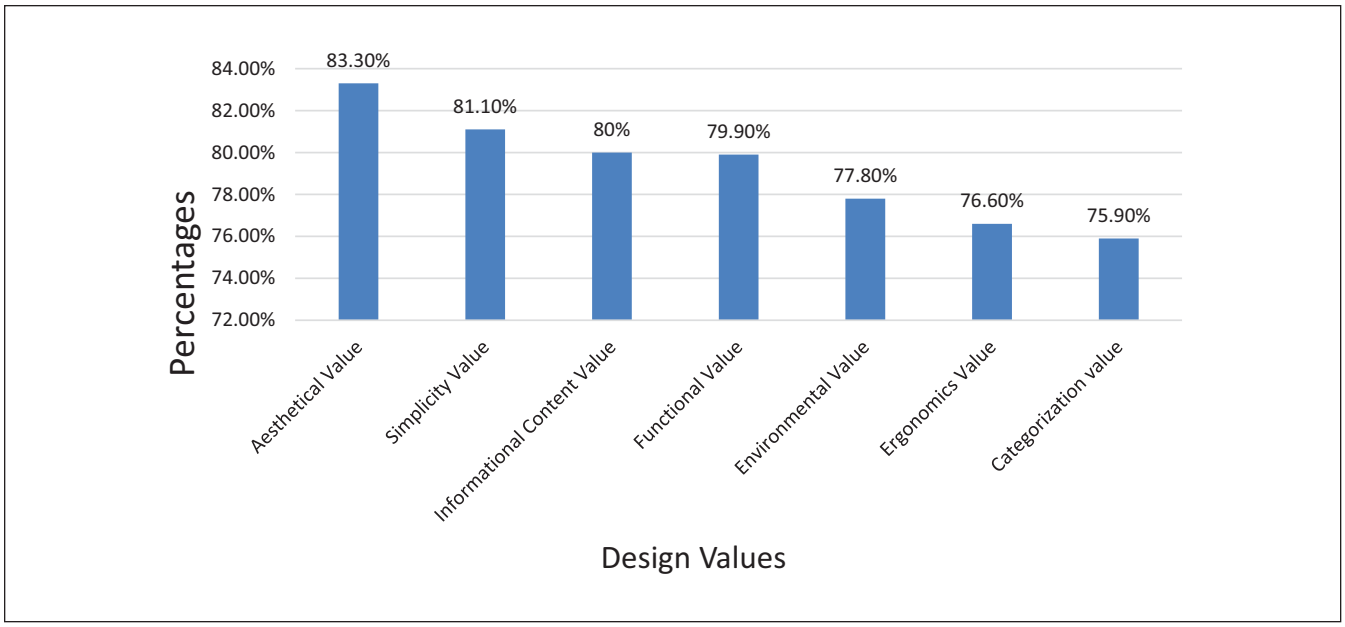
- The different design values have an ethical dimension that must be recognized and activated during the design process.
- These design values can be arranged according to their priority to the ethical/unethical role in the product design.
- The good/bad design is the appropriate approach to define the concept of design's ethics and ethical designer.

Checklist for the Ethical Designer

Designers are human beings; they face the same ethical dilemmas that all human beings face. They also have their private perception of ethical considerations and to prepare themselves as ethical designers. They need to start examining the different design values and thoughts with identification of the targeted users of their products because designers have

Table 5. Final Highest Percentages of the Design Values to the Ethical/Unethical Product Design.

The design values	The simplicity value	The informational content value	The functional value	The aesthetical value	The ergonomic value	The categorization value	The environmental value
The percentages	81.1	80	79.9	83.3	76.6	75.9	77.8



Graph 1. Descending order of the design values according to their ethical/unethical importance in product design.

responsibilities to society, their families and friends, businesses, and brands.

The following checklist includes some important questions that may help designers to be more aware of ethical considerations in their product design because ethics is a process of learning not a process of obedience:

- What does ethics mean to you?
- Do you believe in ethical requirements in design?
- Do you think ethics can help to create a better world?
- What are your ethical steps during the design process?
- Have you created an ethical design before by using colors, lines, clear information, and so on?
- Do you keep ethical considerations in mind?
- Do you consider the role of good/bad design in your practice?
- Are you promoting environmental protection and sustainability?
- Are you going to lie to get your company more sales and market your designed products?
- Will you yield to company pressure to design fake products?
- For how long will you fight to apply your principles and positive values of design ethics?
- Are you plagiarizing from other designers' ideas during the design process? What are the limits of that?
- What we shape shapes us afterward: Do you see this as a true rule in design?
- Are your designs easily misused or misunderstood? How can you prevent that?
- Are your goals bound to any cultural aspects?
- Can you create designs for all, rich or poor?
- Have your designs helped people to change their boring lives?
- Do your designs spread optimistic hope through colors, lines, and so on, and do you think it is one of your ethical roles in society?
- Do you consider the maintenance procedure in your designs and is it done in a safe, easy, and inexpensive way for the customer?

Recommendations

In light of the previous study of design ethics, analysis, discussions, and results, some recommendations can be presented to students, designers, design educators, companies, customers, and so on as follows:

- The ethical aspects should be included as one of the important design criteria during the years of the product design study.

- The ethics of design must be taught to all students of different design fields through an educational course syllabus.
- The term "ethical designer" should be emphasized as a futuristic trend to protect and support customers, global sustainability, and so on.
- Company and society policies must help designers to achieve their missions and ethical goals without any difficulty or pressure.

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