Visual thinking supports industrial design students in product shape design

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Introduction

Visual thinking originated mainly in the field of art, when the viewer looks at a drawing, he thinks visually to understand the message contained in the drawing, visual thinking combines the forms of visual and verbal communication of ideas.

It is a hallmark of innovation and therefore visually minded students have the ability to imagine and visualize innovation in a variety of ways.

Drawings and images are the basis of visual thinking, the image today has become an essential purpose of contemporary human life and thus can be called today's civilization of the image.

The industrial designer is creative and always looks for different sources of inspiration and these sources are numerous and varied from many sources that may be natural sources (organisms - marine organisms - plant... etc.) or other sources of his own.

The research considers that visual thinking methods are one of the important sources for creating new formal formulations of the product and providing quick and many solutions to the shape of the product. The product form is one of the most important factors in design and plays an important role in delivering a message to the consumer.

Research problem:

The urgent need to develop the creative thinking skills of the design student to find many quick solutions to the different formal problems of the product, especially in view of this tremendous and continuous technological development that needs quick, many and non-traditional formal solutions to the product

Aim of the research:

The research aims to take advantage of the visual thinking style in the development of the skills of the designer's industrial design student.

Research hypothesis: -

The research assumes that visual thinking using images helps the student of industrial design to generate design and creative ideas, allowing him to create new formal formulations.

Research limits

The importance of the research

- In the field of design education: -

Shed light on visual thinking methods and how to use them to teach students speed in making many and varied designs.

DOI: 10.21608/MJAF.2021.96291.2501

Research methodology

- Research takes the descriptive approach by identifying the problem, then formulating the problem, and developing solutions to this problem.
- It also takes an innovative approach based on composition and mental experimentation.

Research limits

The research is limited to teaching industrial design teachers different design methods.

Keywords: -

Visual imagination - Visual Thinking -Industrial design

Visual Thinking is a pattern of thinking that arises as a result of the excitement of the mind with visual effects, resulting in the realization of one or more relationships that help to solve a problem or approach a solution.

Visual Thinking (applied in education) is the ability of the student to gain the acuity and difference between different things through a set of many images of things collected under the supervision and guidance of the teacher.

Visual imagination is a process that helps generate creativity and creative ideas, when you unleash your imagination, you swim in the seas of imagination to come up with a new idea, and imagination is a cumulative process through which past experiences are weighted with images that store them before, with excitement surrounding you, and future expectations, all blended into the imagination to come up with a new and innovative idea.

Industrial design as a creative activity designed with the purpose of designing, planning and developing.

Products and systems to perform specific functions, taking into account aesthetic, usage and environmental aspects.

Industrial design researchers must combine creative technical capacity with engineering and production knowledge.

First: Visual thinking

Visual thinking is a tool for rapidly exchanging ideas, both individually and through the mental excitement of the interaction of working groups, as it helps to record ideas and information in a well-defined organized manner.

1- The advantages of visual thinking

1/1 Organize complex information captured successively by the eye such as colors and images and the shapes.

1/2 Evoke previously collected scenes that are of great use to prepare to develop many and varied formal designs.

2- Visual imagination

Visual imagination is a step ahead of visual thinking. Mental images of things are a kind of visual imagination based on the perception of visual forms and the formation of mental models that are stored in the mind of the learner (student) who summons them in the treatment of future

situations if exposed to them and therefore the recipient (student) moves from the processes of thinking from sensory visual images to imagining these images in abstract symbolic images.
Visual thinking is based mainly on the shapes, drawings and images on which the learner (student) relies to solve the problem.

And so we can say that the design problem can be solved in one of the two ways. They are either visual imagination based on the sensory visual aspects and what was stored in the student's mind and used in cases of need for a new design of the product (based on imagination), but the second method is visual thinking based on images and real forms (based on reality), which was used in this research using images to solve the formal problems of the product design and how to inspire those images.

Second: Inspired by the shape of the product

The inspiration of the product form depends on the talent, which is known as the grant, the giving, or the abilities that God has specialized in someone to do something. Talent is not only the set of tools in which artistic work is produced and embodied, but all the tools for collecting and introducing data to the individual through the senses such as vision- hearing- smelling - touch and so on, as well as the abilities of processing data within the individual such as feelings, intelligence and intuition, as well as the ability of the creator and his tools to produce his creations in the form of concept using his manual skills and then this perception turns into a complete idea features and details in the form of visual sketches, geometric drawings and then prototypes of procedures and tests that have to be eventually converted into a tangible product. The designer needs inspiration to feed his ideas and imaginations that pave the way for him to distinguish, innovate and achieve uniqueness and leadership in his design work
The process of inspiration is a sensory artistic process aimed at reformulating the source with more than one vision to achieve new innovative designs according to the requirements of the times, and the visions of the designer, and this process comes only after the excitement of the source (images) of the imagination of the designer, where there is a kind of coexistence between the designer and the source results in many ideas and a variety of ideas, these ideas have non-traditional formal formulations.
1- Methods inspired by the shape of the product
1/1 Direct total inspiration: Through which the designer simulates and transmits the shape of the source of inspiration totally into the shape of his new design.
1/2 Partial direct inspiration: Through which the designer analyzes the source of inspiration from where " exterior lines, colors, configuration, etc. for the purpose of inspiring one or more parts from the source, it is formally reformulated to reach the innovative design.
1/3 Artistic transformation: Through which the designer makes a technical modification of the shape of his new design different from the source inspired by it, that modification may be a partial or total change from source.
1/4 Self-vision: Here the product shape design comes from the designer himself based on his experiences accumulated and acquired from many sources where ideas are new, pure and saturated with his own vision, which reflects the emotions of his leg, to get out what's inside in the form of new designs.
2- Stages of the inspiration process

2/1 Determining the source of inspiration: The designer chooses one or more sources to inspire him/her so that he enjoys. The source must have clear features and familiarity with formal elements such as color, line, composition, etc.
2/2 Inspiration source analysis: The designer analyzes the source of inspiration in order to find out his formal vocabulary and aesthetic features.
2/3 Determining the method of inspiration: Determining the method of inspiration is it a whole or partial inspiration or Artistic modification or self-vision.
2/4 Inspiration tools processing: Inspiration board - Pictures - Graphics - Symbols - Models Stereoscopic - Writings - Scraps... etc.
2/5 Identifying the appropriate means of implementation for the innovative design idea: The designer is inspired by his idea of the design from the inspiration panel in the form of concept
2/6 Achieving the interconnection between the source and the design elements: In this step the designer checks a design that formally matches the inspirational source with its new design produced so it Shows unity, interdependence, harmony and the required familiarity between them.
2/7 The idea is ready to be turned into reality.

Third: - Practical experiments on how to be inspired one of the methods of visual thinking

Some practical experiments were carried out with the students of the third division using one of the methods of visual thinking, which is inspiring images and how the student of industrial design can get inspired from these images and highlight the role of images as one of the methods of visual thinking in the speed of inspiration and solving the formal problems of the product and also support the student in teaching him how to create new design forms from different sources and speed of achievement, this was done by the inspiration board.
Also known as mood board or vision board, the inspiration board contains a collection of images from which the student is inspired by the shape of the product and it is possible to put anything in the inspiration board, words, historical tales, scraps of magazines and newspapers, etc. and below we will review these design experiments:

<u>1- Steam iron design</u>

The student made the inspiration board, including pictures of several buildings (figure 1) and was inspired by one of the buildings in the design of the iron shape (Figure 2). The student followed the method of partial direct inspiration where he inspired parts of the source and reformulated it formally to reach the design of the iron to suit the function.

figure 1

figure 2

2- Vacuum cleaner design

The student prepared the inspiration board, including two pictures of two buildings (figure3) to be inspired by one of them in the design of a vacuum cleaner (figure 4). Here, the student took direct inspiration, using a (transparent paper) and he copied the shape of the building completely and moved it to the design of the broom, so the shape of the Vacuum cleaner has become perfectly matching the building.

figure 3

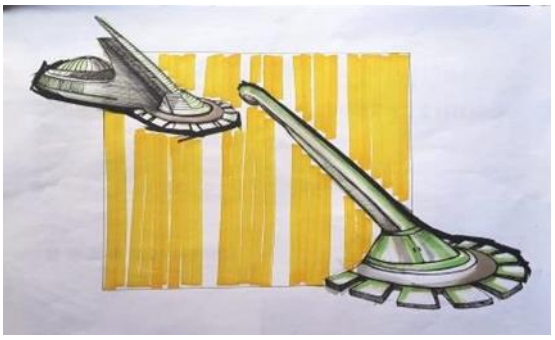


figure 4

3- Iron design

The student prepared the inspiration board, including pictures of several buildings (figure 5) to inspire one of them in the design of an electric iron (figure 6). Here the student used the method of technical modification where he made a partial technical modification by adding the handle to design the iron and here the shape of the iron differed from the source inspired by it where there is no handle in the source.

figure 5

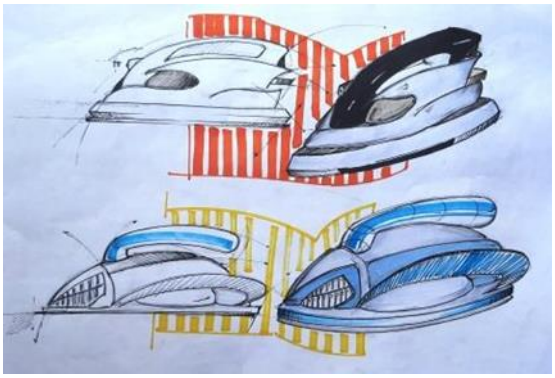


figure 6

4- Design of an electric shaver

The student prepared the inspiration board, including pictures of buildings (figure 7) to inspire one of them in the design of an electric shaver (figure 8). Here, the student blended the style of direct total inspiration with his own vision, where he copied the shape of the building completely and moved to the design of the shaver so that the shape of the machine became fully matching with the building. His own vision was in his thinking of separating the shaver into two parts, the charger and the machine, where the machine was separated from the charger while it was used to shave.

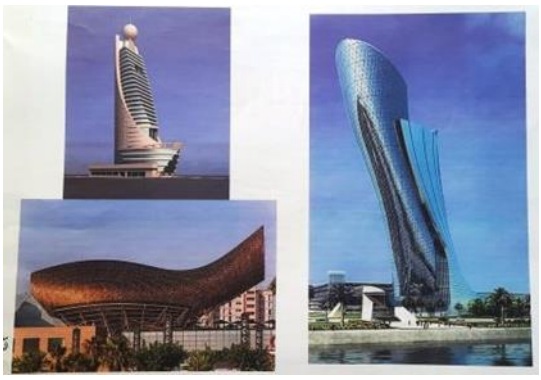


figure 7

figure 8

5- Wireless phone design

The student prepared the inspiration board, including numerous images from all sides of one building (figure 9) to inspire them in the design of a wireless phone (figure 10). Here, the student followed the method of direct total inspiration where he used calque (transparent paper) and copied the shape of the building completely and moved it to the design of the phone so that the shape of the phone became exactly the same as the building.

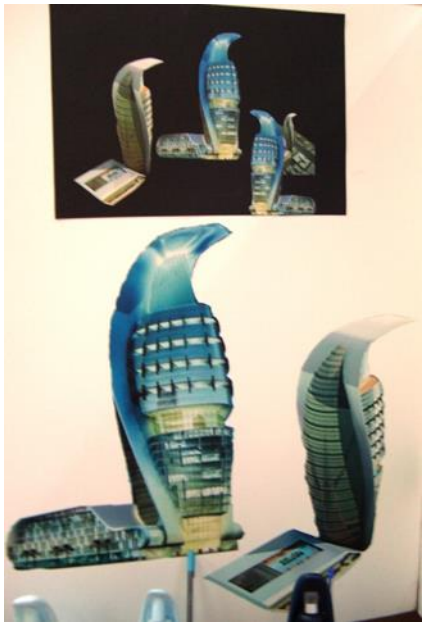


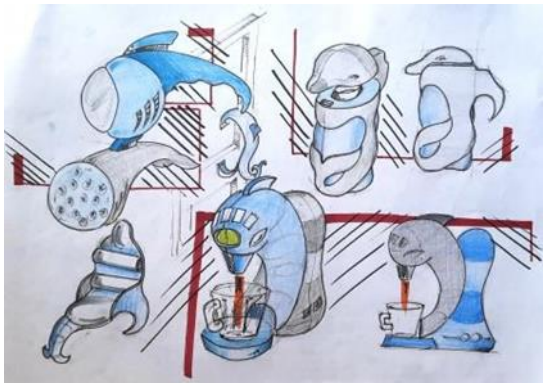
figure 9

figure 10

6- Coffee maker design

The student prepared the inspiration board, including a collection of pictures of Dalvin (figure 11) to be inspired by the design of the coffee maker (figure 12), and here the student used the method of artistic modification taking advantage of the movement of the body of the dolphin and made several designs for the coffee maker.

(figure 11)



(figure 12)

7- Shoe design

The student designed shoes inspired by swordfish. (figure 13) using the method of artistic modification and his own vision in the design of the shape of the shoe where he changed the position of the fins and removed some of them and drape the body of the fish with the shape of the foot

figure 13

Fourth: Results

1. Visual thinking must have a picture to find a solution to the problem. While visual imagination is the search for solutions to something that has been painted with images in the mind.
2. There is a difference between visual imagination and visual thinking, visual imagination depends on imagination, but visual thinking depends on imagination and concrete reality.
3. The teaching person should link visual thinking with visual imagination by helping students view some images in an attempt to use these images in the future by storing them in their memory and when they are exposed to design problems they think about the problem and imagine the pictures that were displayed and thus the student moves from sense to abstract.

4. Visual thinking supports visual imagination and is an important next step to develop certain suggestions to solve a particular design problem.
5. There are four methods of inspiration: direct total inspiration, partial direct inspiration, artistic modification, and self-vision.
6. Determine the stages of the inspiration process and the steps taken at each stage.
7. Students have access to 10 innovative formal designs as an application of the inspiration process using visual thinking.
8. Supporting the student in teaching him how to create new design forms from different sources and the speed of achievement.

Fifth: Recommendations

1- Training the student in visual imagination to solve the problem of design and how to evoke mental models.
2- Training the student of industrial design to practice inspiration by preparing good inspiration paintings to give the applicant industrial design skills to create multiple formal formulations for the product.
3- Include visual thinking methods within the industrial design course.

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