Design of Pictographic Signs for the Educational Area

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Abstract

The text documents the process and the necessary conditions for the design of pictograms during the 'Signage' university course at the Design Department of Guanajuato University, taught as the IV semester design workshop. During this course the student applies visual techniques and specific concepts that conduct to the graphic design of pictograms. These pictograms are used in a product for the educational area that the student must also design.

Keywords

Graphic Design, Signs, Pictograms, Education, Game-Based Learning

Introduction

A different focus to commercial graphic design is that of the educational area. The commercial activity of design is probably the most dominant, yet not its only one, given that design can be applied to multiple knowledge areas. This article shows two cases that were designed by students from the University of Guanajuato in Mexico, both works were classroom exercises applied to the educative area. The first corresponds to the design of signs to teach the study of the bible and the second example uses sign design to learn which objects used in a chemistry laboratory at the middle school level.

The symbols as pictograms are used for the design of signs, nevertheless, the use of these symbols is not an exclusive property of signs they can in fact be used for other purposes. Using Miles van der Rohe's concept, less is more, when the intention is to communicate only with images and without text. Some examples can be found in the label of a t-shirt, in the dashboard of a car, etc. Although there is no specific model for pictogram design, a couple of pictographic systems do exist that can be regarded as prototypes and models of non-verbal communications. One of these was developed by the American Institute of Graphic Design (AIGA), while the second one corresponds to the design of pictograms for the Munich 1972 Olympics designed by Otl Aicher. Both show visual characteristics that became standard due to their simple forms.

Ives Zimermmann in the site www.foroalfa.org describes three basic elements to define a pictogram: 1- The name pictogram signifies image- word, that is, a meaning that can be expressed in a single word. 2- All pictograms are self-explanatory, without the use of words; they do not entail any kind of interpretation as, for example, in the case of a symbol. 3- Shapes in pictograms are extremely synthetized and reduced to its most basic expression in order to be immediately comprehensible in any linguistic or cultural context.

Shape and Style in the Design of Pictographic Signs

Style is detached from the shape, nevertheless, the shape defines the main characteristic from which to identify the designed sign. Style, on the other hand, defines the uniqueness of the shape. In the design of pictographic signs, the shape is allied with the visual representation technique (shape and background), and the synthesis of the shape aids the exact identification of a sign. A simplified shape is not equivalent to simplicity: for example, a black square over a square white surface is synthetic and simple at the same time; still, an image formed by tiny squares can be as complex as it is synthetic. The synthesis of an image, leaving aside most of its features and keeping its most important ones, acquires simplicity, and identifies an object excluding all others. In other words, the features and the shape make a cat be a type of cat and not a type of rabbit. Simplicity can be a fragile balance that depends on a degree of complexity. For example, the pictograms for the 1968 Winter Olympics in Grenoble designed by Roger Excoffon still maintain the value of visual synthesis due to their form, but because of their style, they acquired a high level of complexity.

The design process

I will now speak of the teaching experience focused on

a method that considers the relevance of style and of the shape for the ideation and execution of pictograms in a bachelor's degree course.

In my program under the indication of shape and style, the student must design 25 signs with the shape-background technique. This task has the following conditions:

1. The student has to pick a topic that gathers a group of objects of the same nature, for example: musical instruments, endangered species, independence heroes, etc. In some cases, the set must be reduced; for example, the students chose the musical instruments theme and proposed four subcategories of wind instruments, strings, percussion, and electrics. These groupings allowed that each of the four groups could be codified with a particular color at the end. To avoid choosing a theme that does not represent a high degree of difficulty is a restriction in the design of the exercise. For example, the theme of Mexican wrestling masks does not represent a valid scope of application because they are synthetic and would only require reproducing the same shapes.

2.The object represented must be synthetized and reduced to its basic shapes, just as previously mentioned and it must keep just the elements that make it the object it represents and not another. Typography cannot be used, the signs must be descriptive.

3.Students must design the set with a unique style.

4.Students must draw the strokes over a grid.

5.Students must apply color without losing the original contrast.

6.Students will apply the signs to a project.

The Projects

History of the Salvation. Educational Material. During the design process, students must become aware of several aspects that favor the fulfillment of the objectives. The student starts the sketching process and outline drawing; in this moment one must explain that it is not necessary to use the regular life drawing or copy stroke. The technique that offers the best results is the shape-background one because it favors ample zones of black or white tone and because it produces a closing effect that evokes an additional figure (or more) from a single shape.

Even if students apply the simplification process successfully, using the shape-background they come to produce similar images to figurative drawing of black and white contrast areas instead of an outline drawing. In this moment the professor must intervene to avoid the inertia and stagnation and explain the concept of style and its purpose to reach an original result. When this is resolved, a new design set emerges. Many designs were obtained from applying the signs that allowed to invent ways to expand their uses and shapes towards the fields of education and games.

The first work shown was created in 2015 by the student Karla Yessenia Ríos Jiménez during the university course named "Design Workshop 3." The student is a bible study teacher for children and for six years she has imparted a course called "History of Salvation" in the San Martín de Porres parish in the city of Irapuato, Guanauato in Mexico. Karla Yessenia decided to design pictograms for the teachings of the religion of which she is cathechist in a parish of her home town. The exercise begins when the student draws the first sketches in a brainstorm and little by little solves the strokes, searching for a specific way that determines the first features towards a specific model (prototype) from which the rest of the signs can be reproduced. This first stage requires that the student adjusts the strokes to a grid to control the size, the space, and the stroke so that all the other pictograms repeat according to this first prototype. This is how the notion of a set becomes evident. The student determined a basic grid structure of 6x6 units over which all the pictograms would be designed (Figure 1).

Figure 1. Basic grid

35 pictograms were created in black and white, the characters were represented using basically geometric shapes, the head is a circle without a face, and the rest of the boy is based in rectangles.

All the characters follow a similar pattern and its identification is not achieved through the degree of detail, but through the main characteristics that label them; for example, the Adam and Eve pictograms have prototypical male and female shapes. Nonetheless, the representation of certain pictograms is associated with a biblical passage. (Figure 2)

Figure 2. Adam and Eve

For example, the pictogram that represents David and Goliath is represented by the event that narrates their confrontation. David is represented in a smaller size than Goliath, with the slingshot in his hand and Goliath with a sword in hand. To represent Judas Iscariote, the student picks 3 symbols that determine the meaning of the pictogram, the event narrated is the hanging of Judas after betraying Jesus of Nazareth, the number one symbol is the three, the second one is the rope and the third is dead Judas, hanging from the rope. (Figure 3)

Figure 3. Judas Iscariot

The use of color as a code is very important in each pictogram, the color blue signifies the sky, the water and the clouds, the color red, blood and fire (hell), the color pink shows in each character to identify the color of human skin.

The pictograms were used as a game- based learning resource so the children learn by playing. The game of *Lotería* is very popular in Mexico, it is played using 54 cards and four to six templates or more, each with 16 images. There is a person in charge of showing one card at a time and show it to the players. Whoever has the image on their template marks it and the first player with a complete template wins the game and yells *Lotería!* Originally, this game is illustrated with traditional images of real and fiction characters widely recognized in Mexican culture such as *el mariachi*, the Moon, the mermaid, the watermelon, the dame, and many more.

Chemistry Lab. Educational Memory Game

This work was produced in 2015 by the student Israel Hiram Ávila Zamudio during the course Design IV Workshop 'Signage' in the fifth semester of the bachelor's program in the Graphic Design department of the Guanajuato University, Mexico. It shows us 50 designed signs that represent 50 different accessories and tools used in a chemistry lab (Figure 4).

Figure 4. Pictograms samples

The intention is that these pictograms are used like a didactic resource by a professor in the middle school level. Just like the previous project, the student had to draw over a geometric grid, but in contrast to the latter project, each square of the grid was divided by four axes, the horizontal, the vertical and two diagonals, one to the left and one to the right. This subdivision allowed greater stroke precision (Figure 5).

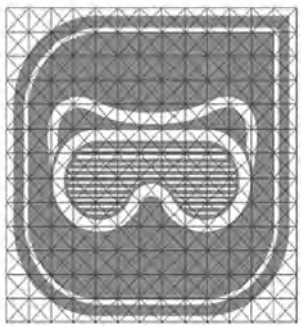

Figure 5. Basic grid

The student organized the accessories in categories as well:

- Volumetric tools
- Separation tools

- Heating tools
- Glass general use tools
- Other general use tools
- Holding tools
- Safety and cleaning tools

Lastly, the student applied the pictograms to the well-known game memory, which helps identify and memorize each of the lab utensils. Unlike the traditional game that involves finding two cards of the same kind, this game has a greater degree of difficulty, as it divides each pictogram in two so the player searches and finds the part that coincides with its other half (Figure 6 and 7).

Figure 6

Figure 7

Conclusions

This sample of academic work shows how graphic design can positively influence the creation of didactic materials that can be applied in different educational topics. These classroom exercises do not simply fulfill the objective of basic design principles for pictogram design, but also, at the end of their studies, students can show them in their professional portfolio. They also have the opportunity to present them as marketable proposals and lastly, this work can become the topic to obtain the bachelor's degree.

Author Biography

Full time professor,Department of Design of the University of Guanajuato since 2003. Degree in Arts with option in Graphic Design by the Faculty of Visual Arts of the University Generation 86-91. Master of Visual Arts, Academy of San Carlos. National School of Plastic Arts,. Generation 95-96. Master in Visual and Intermediate Arts from the Polytechnic University of Valencia, Spain. 2009. Doctorate in Visual Arts and Intermedia, Polytechnic University of Valencia. Coordinator of the Degree in Graphic Design at the Universidad del Valle de Mexico San Rafael campus. 1999-2001. University professor of graphic design, with a teaching experience of more than 15 years. He has worked in different universities among which the following stand out: University of the Valley of Mexico campus San Rafael. 1997-2001, Simón Bolívar University. 2000-2001. ENEP Acatlán, México City 1999-2001. National University of Mexico, UNAM.