

# NEO-CRAFT AS A TREND TO DESIGN A NEW TYPOLOGY OF 3D PRINTED PRODUCTS

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## ABSTRACT

The concept of crafts is linked to the manual art of creating utilitarian or ornamental objects with traditional materials and processes guided by a generational knowledge. Adding new technologies and materials is acceptable considering boundaries guided by the presence of human customs and family heritage.

The history has been led since the human being exists, as a domain of the material and the development of technologies to transform it being capable to create tools that are useful for their survival.

Neo-Craft is a neologism that gives name a new trend in product design where tradition and technology crossover to bring a new typology of products, linked by folk tradition and the richness of cultural manifestations that people maintain through generations with new ways to manufacture using non-conventional materials and processes.

Over a one-week workshop, undergraduate students of Industrial Design programme, designed neo-craft products blending Mexican folk tradition with digital manufacturing technologies.

This paper describes the process in the implementation of the challenge and presents the discoveries that were found during the workshop.

*Keywords: Craft, 3D printing, digital fabrication, folk tradition, educational innovation, professional education*

## 1 INTRODUCTION

Mexico is a country with a great tradition in the creation of handicrafts since it has a vast territory inhabited by a great diversity of cultural manifestations due to its cultural wealth that still exists nowadays.

Crafts and design often are confused by the people due to the thin line that divide both concepts, craft is linked with handicrafts and tradition whereas design is related to certain principles and values centred on the study of the user needs and requirements [1].

Clara Porset is one of the most representative examples that crafts and design can coexist in an object, she pursued to integrate the Mexican folk arts with utilitarian products that are designated to be part of the people's everyday life [2]. Her approach to bring low-cost design, mixing modern elements with folk values, creates a new vision in which both art and design scaffolds the further Mexican identity.

The boundary between artisan expression and design authorship is very thin but can be linked by the signature which is dynamic and unique and defines an artistic object [3]. The signature usually is linked to handmade products by the aesthetic style, but it also can be given by essential elements embedded in the object, the manufacturing technique is not the only way to give authenticity to a craft product, but the background of the author is an important approach to translate it into design elements.

The need to fit this typology of products into a disruptive definition is necessary to start working with the students in the workshop. Their profile as Industrial Designers needs to expand essential concepts that facilitate understanding and empathy to artisan's guild and their craft.

## **2 CRAFTS AND DESIGN**

The industrial revolution broke the paradigm that the objects must be created only by human hands, the introduction of the machine as a creation instrument generates a new way to transform raw materials into consumer products allowing iterative manufacturing and expanding to reach to a wider public.

During the 1851 Great Exhibition, Henry Cole curated an interesting catalogue of products that collided the use of the machine as an instrument of creation and the expressive elements that give value to the object, mixing an interesting and encouraging new typology of products that changed the way in which the people lived and their relationship to their everyday activities [4].

### **2.1 Crafts tradition in Mexico**

Prior to the arrival of the Spaniards in Mexico, pre-Columbian cultures dominated the American continent as well as its diversity of cultural manifestations that coexisted with each other.

After the conquest, cultural syncretism gave way to one of the greatest stylistic surges in the history of mankind, since being culturally opposed civilizations they merge into an amalgam in which the different styles and worldviews were mixed.

Mexican crafts contain Indigenous and Spanish elements that together present a diversity of colours, shapes and symbolism that are unique in the world.

Some of the artisan manifestations in Mexico have been considered as an intangible world heritage by UNESCO [5], but despite the recognition and protection that has been granted, it continues to be a precarious economic activity that does not guarantee a secure income for those who practice it. In turn, exposure to gentrification and cultural appropriation has brought the tradition at risk due to bargaining and piracy is a common practice.

According to the initiative for a Mexican government law, a craftsmanship is “any economic activity aimed to create, produce, transform and provide goods and services, through unique manufacturing systems in which personal intervention is mandatory for the control of the production and finishing process. This activity will be based on the domain or knowledge of traditional or special techniques in the selection and treatment of raw materials or in the aesthetic sense of their combination and will have as a result an individualized product, not susceptible to totally mechanized production, for its commercialization as a craft product [6]”.

### **2.2 Crafts + Design in Mexico**

Designing is solving user problems, solutions can be given based on products, services, systems, spaces, buildings, visual communication, virtual interfaces, food, emotions, experiences, interactions and all the sensory pathways that the human being can perceive.

The cultural richness in Mexico is one of the strengths that provided a fertile ground to the first persons that decided to do design in the country.

After the World War II several foreign talents arrived with the intention of give the Mexican industries the possibility to create products with design values that ensure production quality, economic royalties and customer loyalty.

In the 60s the first Industrial Design schools were opened with the intention to provide local industry professional creative profiles. Mexico entered a stage of promotion supported by the Mexican government during the 70s, with the aim to impulse international exports [7].

Nowadays Mexico has a globalized view that integrates not only local tradition but internalize the external references to create a universal design language that has its own identity.

It could be very easy to believe that since Mexico is a country with a long tradition of craftsmanship and an incipient career in design both activities could merge naturally, and in a certain way they do.

However, there could be a disadvantage for those engaged in crafts activity to the creative, cultural and intellectual exposure of their work, the colonialist practices could manifest during the design process.

The designer's ethic stipulates that the link with artisans must always take place in a co-design environment, giving authorship credit bilaterally and recognizing that the distinctive symbolic elements of the artisan work are native and belong to their cultural heritage. It must be considered that those who dedicate themselves to craftsmanship deserve recognition and fair remuneration for their work always in a sustainability frame.

### **3 NEO-CRAFT**

Neo-Craft is a composed word that combines both concepts Neo (New) and Craft (Artisanal), it is defined as “the alliance between design and artisan production techniques, focused on the search for authentic and respectful objects towards the person who creates them and towards those who introduce them into their intimate environment [8].”

The Neo-Craft frames the possibility to create design products by designers without limit the production techniques or restrict only the traditional influences in the creative process. It results to be a vehicle to manifest different versions of the particular vision of the designer and how they understand the personal relationship between user and object in order to create an intimate bond that expands the experience of the product by itself.

The elements that a Neo-Craft product must manifest are [9]:

- To be useful
- To be beautiful
- To be created by modern technology
- To frame universal aesthetics
- To highlight individual creativity

Neo-Craft is a term to define a new typology of products that allows anyone to create semi-artisan objects based on the heritage of their own culture without worrying about possible conflicts of interest related to artisan work. All this using modern technological resources and from the perspective of industrial design.

### **4 WORKSHOP FRAMEWORKS**

The one-week workshop is offered as an initiative called *Semana i* by Tecnológico de Monterrey. These courses are stand-alone elective workshops that are scheduled once a year, the students decide which experience they want to live. *Semana i* requires immersive work by both students and teachers so they pause regular academic activities to dedicate 5 days to strengthen competencies for their professional life. The main objective of this workshop is to design handcrafted products using advanced conceptualization and manufacturing technologies with the intention of developing utilitarian and ornamental objects with materials and processes based on emerging technologies.

The workshop was scaffolded around the following elements that allow the students to conceptualize and design a Neo-Craft product.

#### **4.1 Autoethnography**

Is a method of primary qualitative research in which the researcher conducts a self-observation of their subjective experience and is described as an historical record of self-memories by the same designer [10].

Some authors define autoethnography as autobiography, which is very convenient for the exercise of the workshop since a search is made in one's own family history with a focus on moments of childhood.

#### **4.2 3D Printing**

3D printing is one of the most popular rapid prototyping techniques because the cost is low, and the level of detail and complexity obtained in the prototype is very high. The 3D printing technique used for the workshop is FFF (Fused Filament Fabrication) and the students must prepare all their deliverables to 3D print eventually.

The workshop was integrated by students from the last third of the programme, their 3D modelling skills were at an advanced level. Different software were used according to their expertise, looking for the files to be exported as STL and printed using Cura to do the slicing.

### **5 METHODOLOGIES**

The elective workshop was given over five days in which the activities were divided following the traditional design process as a basis and focusing on creating a new typology of products mixing the crafts rhetoric and manufacturing it with digital fabrication techniques.

Students involved: 15

Students profile: Industrial Designers

Teachers involved: 2

Experts invited: 2  
 Workshop length: 5 days  
 The schedule of activities was implemented as follows.

Table 1. Workshop Schedule

Activity	Day	Deliverable
Debate: Are designers capable to be artisans?	1	Verbal participation
Conceptual development	2	Conceptual map
Design brief	2	Poetic Prose
Product configuration	3	Sketches
Product development	4	3D modelling
Final presentation	5	Infographic

### 5.1 Debate: Are designers capable to be artisans?

In this activity experts were invited to classroom in order to bring their knowledge about the topic and to open the question if designers can be capable to create artisanal objects. In this exercise the students receive the Neo-Crafts concept as an open field to explore new creative possibilities.

### 5.2 Conceptual development

The students had to declare a concept using a conceptual map where they make an autoethnographic exercise recalling their childhood memories linked to the traditions and rituals that define their Mexican identity given by their family heritage.

All those elements help to assemble a design concept, trying to define a product that frames these remembrances and nostalgic recollections.

### 5.3 Design brief

The writing of the brief had the intention of not adopting the professional format and giving it a more poetic character. The students read a text by Octavio Paz in which he expresses himself about craftsmanship, evoking its emotional aspects and elevating the object as the pinnacle of human expression.

After the reading, they wrote a poetic prose in which they referred to their object in a personal and subjective way, linking them emotionally and generating a value based on their personal history.

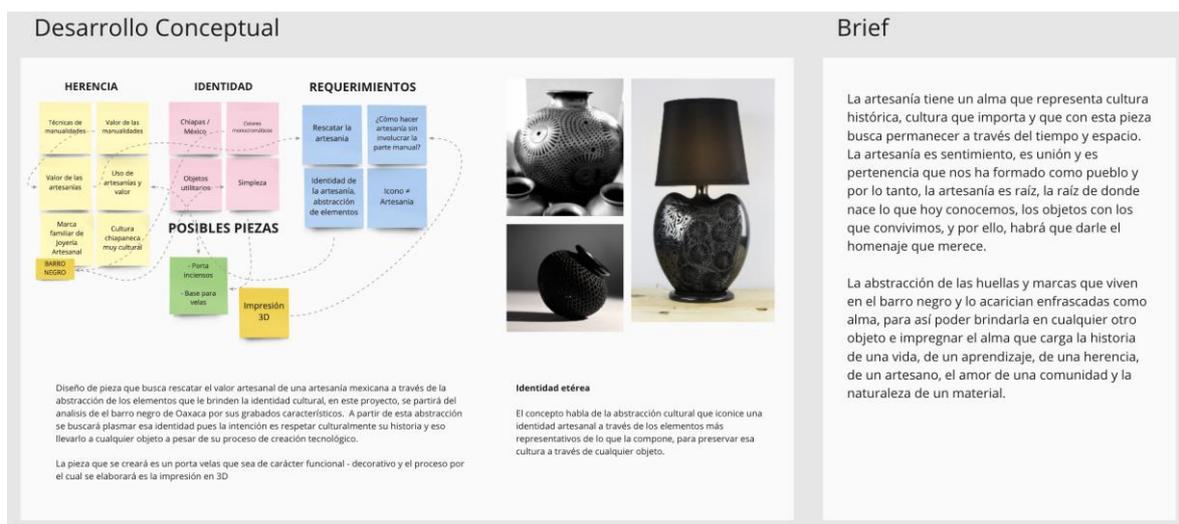


Figure 1. Student's example of auto-ethnography exercise, conceptual development and design brief

### 5.4 Product configuration

The students start sketching, bringing form and function to the Neo-Craft object and configuring the main concept into a design proposal.

They developed several design proposals aiming to find the most aligned to their design brief and the one that matches the project requirements.

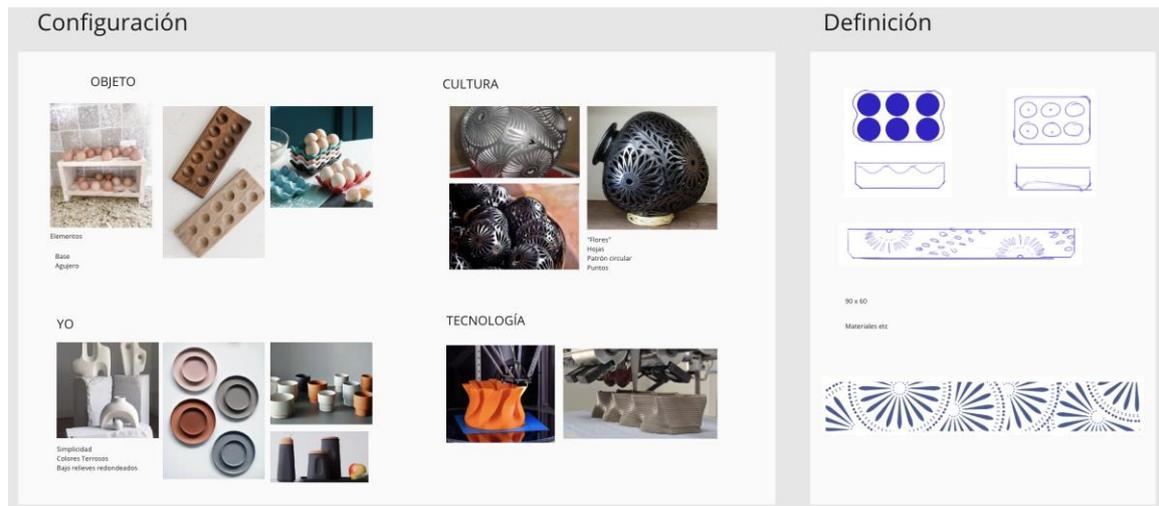


Figure 2. Student's example of product configuration and definition

### 5.5 Product development

Diverse 3D modelling techniques were used by the students, the aim of this exercise was to generate an input for a successful 3D printing process.

Considering the characteristics of the products, the material selected for the printing of the Neo-Craft objects were CopperFill, SteelFill and BronzeFill filaments giving a handcrafted feel despite having been created by a computer assisted machine.

### 5.6 Final presentation

The students prepare an infographic poster where they place a final render of their product, and describe the following elements:

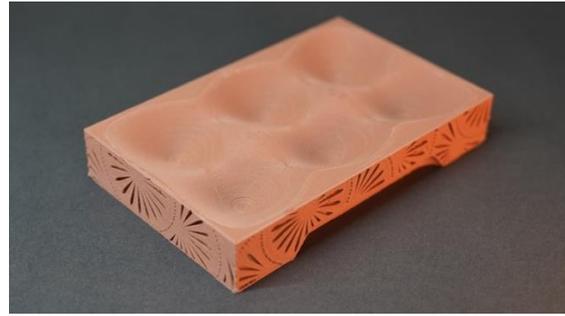
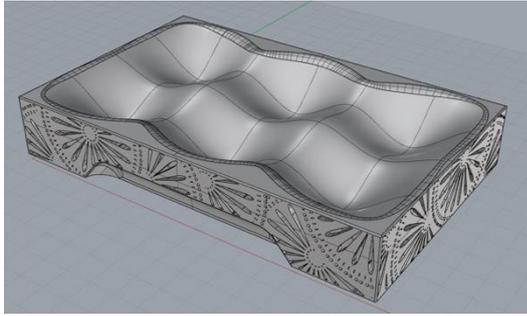
- History
- Meaning
- Ritual
- Use and function
- Technique
- Material

## 6 RESULTS

Due to the short time to implement the workshop and considering the design process needs a specific amount of time to ensure the concept development is strong enough, the 3D printing of all the design was programmed after the course ended. The results were satisfactory, and the products designed and developed were a successful exercise of autoethnography, conceptualization and digital fabrication.

The students developed a diversity of proposals derived from their personal experiences and family rituals, from objects to continue the home traditions to products linked to the cultural manifestations of the region, all of them demonstrated to have a very strong bond of inheritance not only personal but from the community that has been maintained for generations.

They developed a product with artisan characteristics created by digital manufacturing processes, it does not convert the result into modern handicrafts, since it does not contain the necessary elements to be considered as such. However, the concept of Neo-Crafts fits perfectly into this type of product since they are useful, beautiful, created by modern technology, framed a universal aesthetic and highlight the individual creativity of the author.



Figures 3-4. Student's example of 3D model and printed Neo-Craft product

## 7 CONCLUSIONS

The students considered this workshop as “an interesting approach to see crafts from another perspective”. The link between artisanal and modern technology only can be given by the perspective of the Neo-Craft trend into the product design profession.

They understand that they cannot be considered as artisans because their design activity lacks heritage and tradition but having this perspective into configure new typologies of products that can have both remembrance and technological implementations and having a responsible agenda of empathy, sustainability and respect for all the cultural manifestations they are free to create new ways to express their artistic curiosity.

Like Clara Porset once said: “A form made by machine is no less beautiful than a form made by hand.”

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