

TEACHING OF INTERACTIVE DESIGN: REFLECTIONS ON DESIGN PRACTICE

Martin Groisman¹, Alejandro Papa²

^{1,2} Research professor, MAEDI – Master in Interactive Design, FADU – Facultad de Arquitectura, Diseño y Urbanismo, UBA – Universidad de Buenos Aires, Argentina, martin.groisman@gmail.com, alepapa@gmail.com

Abstract The aim of this paper is to reflect upon the teaching of Interactive Design, detailing the educational processes, methodologies, and different exploration and production strategies of design practice. Interactive Design's field of intervention is the result of people's interaction with digital information processing systems. This field is not just limited to what happens on a screen or to the design of apps and online platforms, but rather involves all the senses, as well as the body as a whole and its relationship to space, objects, and other bodies. Looking upon design in relation to other interactive systems involves considering multiple complex factors, and exploring the limits and bridges between art, science, and technology. In this context, we introduce three projects developed in the MAEDI Design Laboratory (2018/19) that represent the different exploration and production strategies of today's design practice.

Keywords Interactive design, Design teaching, Design method, Digital culture.

Introduction By creating MAEDI, acronym in Spanish for *Maestría en Diseño Interactivo* (Master in Interactive Design), we seek to meet a series of challenges related to the human-computer relationship which arise in the context of the techno-media-global society. To this end, MAEDI aims to build a space for teaching, research, and professional training that combines the different areas within the design field with electronic media and digital data processing systems.

In the past years, digital culture has expanded, bringing relevant changes in how organization, production, and interrelation take place in society. Large-scale data processing (macro data), the multiplication of information networks (social networks), and the study of new materials (bio/nanotechnology) pose new social scenarios for project intervention.

The proposed strategy aims to connect design thinking (Architecture, Landscape, Industrial, Graphic, Audiovisual, Clothing, and Textile Design) with the exact, social, and biological sciences, electronic and systems engineering, as well as with philosophy and psychoanalysis, in order to respond to the new challenges imposed by artificial intelligence, biotechnology, and telecommunications.

We conceive Interactive Design as any project practice resulting from the relationship between people and digital information processing systems. Interactive Design does not only involve a screen nor the design of apps and platforms, but also refers to how the senses and the body as a whole relate to space, objects, and other bodies. It constitutes the interaction between the body and the machine; a system that allows for constant feedback from objects, spaces, and people. We perceive reality through a suite of devices that enhance our senses and widen our perception. It is in the interaction between the man and the machine that we find the field of action to think and reflect upon the processes and systems that are intrinsically related to us.

In this context, we introduce three projects that explore different aspects of today's design practice and that were developed during the first cohort of the master's program, between 2018 and 2019. In this way, we set out the teaching processes and methodologies developed from the joint effort of the master's program theoretical areas and Media Laboratory.

Based on the exhibition of 3 projects developed as part of the master's program, the way in which we conceive the intervention of Interactive Design becomes evident. The *Voronoi 3D project* is based on the study of the possibilities brought by Parametric Design and digital fabrication. The aim of this project was to generate a link between geometry, design, 3D modeling, programming, and digital manufacturing. *Proyectos de Biodiseño* (Biodesign Projects) experiments with the cultivation of fungi, algae, and bacteria for the development of bio-sustainable projects. The objective was to propose ecological materials, creating structures or concepts related to architecture, design, or visual arts and then featuring them in a macro-scale project. Finally, *Proyecto Kodek* (Kodek Project) constitutes an installation based on the concept of autopoiesis, and it is formed by a modular, manipulable structure that works on an electronic system featuring sensors and data processing generated from the interaction with the public.

For more information about the projects, refer to the paper *Parametric Design and Biodesign Projects at the Design Laboratory (MAEDI/LAB)*, and *Kodek Project: An interactive installation by MAEDI/LAB*, part of this publication.

The evolution of design practice The definition of design has evolved throughout history based on the technological, economic, social, and political changes of each time and place at a global scale. Since the beginning of mankind, people have invented devices that solve their habitat, transportation, and food needs. These inventions have introduced them early-on into practical activities. In the 20th century, these practical activities gained their own statute, a specific field of training, and that's where the concept of design comes from.

The history of design teaching held the Bauhaus School as a fundamental reference to define the specific field of action of the design disciplines. Masters such as Kandinsky, Gropius, Mies Van Der Rohe, and László Moholy Nagy defined the characteristics of a rigorous and creative training space with a strong presence of artistic values. The Bauhaus School's famous circular representation of the curriculum (Gropius, 1922) includes the study of nature, the study of color, and the analysis of materials and tools, as well as the study of construction and representation systems. This diagram clearly explains the transdisciplinary nature of design and the importance

of experimenting with materials, where architecture communicates with graphic design, fashion design with theatrical performance, and object design with visual composition.

Another fundamental reference in design education is the Ulm School. Between 1949 and 1950, Aicher, Richter, and Scholl developed detailed plans for a full-time college. A typewritten synopsis lists seven major themes: politics, journalism, broadcasting, photography, advertising, industrial design, and city planning.

The time of exclusive professional specialization is over. Politics, science, art, and economics must be viewed in their integral relationship. Education for knowledge must be replaced by education towards unprejudiced *universal thinking*. (Scholl, 1950).

The activity of the School began in 1953 under the direction of Max Bill. At the beginning, the school was divided into five departments: Product Design, Visual Communication, Construction, Computer Science, and Cinematography. In 1956, Tomás Maldonado (an Argentine painter, industrial designer and theorist of design) began working as Rector/President. He completely modified Bill's original structure to shift education toward scientific processes and technologies toward mass production, suggesting a progressive distancing from the dominant artistic discourse to introduce a strong link with the productive world. This new circular scheme (Scholl, 1950) of the program aims to include, in addition to the projectual disciplines, contents related to politics, economy, sociology, psychology, and philosophy.

The pursuit of the Ulm School culminated toward the end of the 60s, but design teaching spread across the world, generating training spaces across all continents. Every decade, social and techno-scientific changes were incorporated to this activity, modifying the design practice.

In the current digitalization of society comes the concept of Parametric Design, which radically modifies the methodology of the design process, transforming the production of spaces and objects, as well as the communication systems. Parametric design is based on the generation of geometries as per the definition of initial parameters, as well as the programming of the formal relations between them. In this way, a whole range of potential design solutions is automatically generated by the system. This makes it possible to establish models that allow for the simulation of natural phenomena, social behavior, or different mechanical and physical processes.

The emblem of this stage of society is the incorporation of Artificial Intelligence to the different instances of the design process, radically changing the methodologies in which objects, systems and spaces are conceived and produced.

Thus, the field of intervention of Interactive Design refers to priority issues related to production and social development, such as: visual communication, information design and data visualization, interactive media communication, architecture and city planning, as well as the design of machinery and smart objects.

In this sense, we consider the work of Neri Oxman (MIT Media Lab) fundamental, since she proposes a new paradigm in design education that incorporates computer design, digital manufacturing, materials science, and synthetic biology. As in the previously analyzed cases, she

relies on a circular scheme, *The Krebs Cycle of Creativity* (Oxman, 2016) to highlight four disciplines: art, science, design, and engineering—which interact and intervene modifying the field of culture and the field of nature.

Based on this brief historical review and from the interpretation of the current project field scenario, we have established a potential typology to organize the master's thesis projects according to a scheme that establishes four interlinked areas with diffuse borders that constitute a constantly reconfiguring pattern:

- 1) *Bio-Design*: inspired by biological processes and the exploration of new materials and digital fabrication processes.
- 2) *The Design of Intelligent Systems*: oriented toward automatism, robotics, computing, and electronics; including robots, drones, sensitive textiles, smart cities, and artificial life.
- 3) *Service Designs*: oriented toward management across different forms of social organization; including social networks, data visualization, process simulation.
- 4) *Design Fiction*: based on a theoretical vision oriented toward the development of future scenarios, hypothetical realities, and unlikely situations.

This typology intends to leave the scheme in which the design field is usually organized, whereby design knowledge is classified based on a rigid model that attributes the exclusivity of space to architecture, visual systems to graphic design, objects to industrial design, and textiles and wearable's to fashion design. This scheme, which can be found in the academic structure of many universities, must be revised in order to give way to the multiple crossovers and exchanges that take place in designers' field of interaction.

In conclusion, depending on the dynamics imposed on society by the increasingly frequent changes in the field of culture, science, and technology, it is necessary to periodically review the reference frameworks, methodologies, and design production processes. The current situation, characterized by a serious environmental, health, economic, and social crisis at a global level primarily calls for reinforcing the values of eco-sustainable design, promoting the reuse, recycling, and reduction of carbon emissions.

As the context changes, new actors emerge and new patterns burst into the social fabric, challenging the prevailing knowledge and giving way to new paradigms that relate to the understanding of the design practice universe.

References

- Antonelli P, Burckhardt A. (2020) The Neri Oxman Material Ecology Catalogue. Published by The Museum of Modern Art, New York. Pages 16-17. Available at: <https://www.moma.org/calendar/exhibitions/5090> [October 30, 2020]
- Gropius W. (1922) Diagram of the Bauhaus curriculum. The Temporary Bauhaus-Archiv museum für gestaltung. Available at: https://www.bauhaus.de/en/das_bauhaus/45_unterricht/ [October 30, 2020]
- Oswald, D. (2013) Universal Dilettantes And Blinkered Specialists: Historic Models And Future Potential Of Interdisciplinary Design Education. *International Conference On Engineering And Product Design Education* 5 & 6 September 2013, Dublin Institute Of Technology, Dublin, Ireland. Page(s): 599-604. Available at: <https://www.designsociety.org/download-publication/34776/> [October 30, 2020]
- Oswald, D. (2015) The Information Department at the Ulm School of Design. AIS/Design. *Storia e Ricerche*, No. 6, December 2015. *E-Journal of the Italian Association of Design Historians, Special issue on "Designers and Writing in the Twentieth Century"* edited by Fiorella Bulegato, Maddalena Dalla Mura and Carlo Vinti. Milano, Italy. Available at: http://david-oswald.de/downloads/Wachsmann-Oswald-2015_Writing-As-Design-Discipline.pdf [October 30, 2020]
- Oxman, N. (2016) Age of Entanglement. *Journal of Design and Science*, Published on: Jan 13, 2016, Updated on: Jul 15, 2019 DOI: 10.21428/7e0583ad Available at: <https://jods.mitpress.mit.edu/pub/ageofentanglement/release/1> [October 30, 2020]
- Scholl Id Aicher O. Geschwister Scholl Hochschule: An active school for science, art and politics in Germany. Undated script, ca. 1950 (HfG-Archiv, Ulm)