

Transforming Education by Transdisciplinary Collaboration



Christoph Holliger, Ed.

Cover Graphic:

After Max Matter, *Kopfraum wechseind*. 1982.
Crayon on Paper. Collection Kunsthaus Aarau

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Prof. Dr. Christoph Holliger, Editor
University of Applied Sciences and Arts Northwestern Switzerland

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Figure 1: Poster for *Cunard Line*, 1914, which inspired Le Corbusier's *Paquebot*.

The Value of Metaphors in Architectural Design

Fabrizio Leoni

The intellectual activity that we – in schools of architecture and town planning – generically call «project» has since a long time ago abandoned its comfortable role as a problem-solving procedure, as a performative answer to a precise question, to assume that, tentative and generative, of the detector of a context's potential, of a tool devoted to unveil a place's qualities hidden behind its stratified daily use.

Every place (locus) is the result of layering – often conflictive – of events and objects belonging to different systems: social-anthropological, biological-natural, historical-cultural, et cetera; each of them understandable and catalogued through the instruments of the discipline to which it customarily belongs. To each of them, a language and a method of representation - a code - is associated.

The «project», in order to achieve an enhanced level of disclosure of such a deep structure and to modify its organization, increasingly engages in a non-hierarchical and simultaneous mode with this heterogeneity of tools, languages and codes, through and beyond the narrow domain of each discipline; or - formulated differently - does turn on a trans-disciplinary mode. At that point, it finds itself in a need to build semantic bridges among those different disciplines; bridges on which transformative operations of the «real» can take place.

Sometimes these bridges just imply borrowing some concepts from neighboring disciplines, sometimes they appear to be nomadic keywords, which change their meaning and effect in the transition from one discipline to another, landing to indicate things and processes even radically different from the original. Sometimes these concepts act as powerful metaphors, deviating from their conventional use to eventually morph into alternative scenarios, ending up with a re-configuration of the «real». And thus, both purposefully and accidentally, revealing potential research perspectives.

Far from being able to form a new conceptual system that respects falsifiability and scientific criteria, these deviations operate at the reference level, acting in depth but suggestively, associated more to a metaphorical assimilation process or transfer of meaning than to a logical and repeatable sequence of a deductive type.

External references, metaphors, adjacencies, nomadism, coinages, words in transition, re-combinations, analogies, allegories, each with its own specific role, act as re-foundations of the «narrative», thus producing a new emerging sense. Such moving concepts do not necessarily transfigure into formal organizations, faithful to the concept itself. They do not act directly, but

through the unfolding of events, transactions, protocols, as in the case of many contemporary architects and planners whose work reflects economic, social, technical and cultural conditions, assumed as the «opportunities» of a project background.

The «disciplinary archive» of concepts, usually filled of words such as «proportion», «scale», «composition», «partition», «harmony», «pattern» et cetera, is enlarged by transdisciplinary research to include other ingredients from philosophical terminology such as «plie», «rhizome», «espace lissé/strié» by Deleuze et Guattari or «catastrophe» by Thom or «complexity» by Kuhn. Not differently, words from the natural sciences as «tipo» or «territorio» are scavenged by Aldo Rossi and Vittorio Gregotti, and subsequently displaced, simplified or twisted, adapted with no literal compliance with their normalized/disciplinary use¹. But rather, towards a stubbornly laborious and slow operation of re-assemblage of the original meaning, «fluidity», «density», «strength», «plasticity» ... are ordinary terms from the hard sciences that, while parachuted in the design area, tend to express qualitative spatial values, away from their home quantitative rigor.

Sometimes images and artifacts also play a transfer role, allowing for a lateral interpretation of an obvious or significant figure. While the formal appearance of a crab shell directly inspired Le Corbusier's shaping of the Chapelle Notre Dame du Haut de Ronchamp, the very image of an ocean liner suggested to the same author a deeper allusion to its multiple symbolic functionalism. Organization, form, language, control over nature, memory or dream of a journey, isolation, exclusiveness: The ultimate hetero-topic territory driving the «modern» trust on a habitable machine. (See figure 1).

Stepping just a level ahead, the early fascination for the «machine» of modernism is exposed nowadays to the incremental power of digital imagery, especially on the specific side of recombinant and computational assemblages. The taxonomic attitude behind the predominant logic of the «strata», induced by the recent strong use of «layers» in the computer aided design would suggest a manipulation of a physical reality as sectioned in themes, modules, self-containing worlds to be treated separately. Accordingly, other profiles than just a specialized technician – typically architects or engineers - might now engaging in design as if a building was meant to be an assembled device rather than – as it has been in the past – a single massive organism.

Out of the many possible teaching/researching activities recently carried out in trans-disciplinary and multi-scalar design environments, two different programs can be brought up to exemplify some of such transitions: the Project Oriented Learning Environment POLE (with its daughter project elope) and the 2015 Expo Cluster Design Workshop at the Politecnico di Milano.

The Project Oriented Learning Environment promotes a paradigm shift from a supply-pushed to demand-pulled learning, by fostering a product oriented iterative design cycle as opposed to a sequential one. Within the acknowledgment of a growing drive for the amalgamation of different disciplinary

¹Further reading:

- Gilles Deleuze, Felix Guattari, (1980), *Mille Plateaux*, Éditions de Minuit, Paris
René Thom, (1972), *Stabilité structurelle et morphogénèse*, Interéditions, Paris
Thomas Kuhn, (1962), *The Structure of Scientific Revolutions*, University of Chicago Press
Aldo Rossi, (1966), *L'architettura della città*, Marsilio, Padova, 1966
Vittorio Gregotti, (1966), *Il territorio dell'architettura*, Feltrinelli, Milano

contributions – coming from fields as diverse as sociology and structural engineering - as the only predetermined «rule» for the richness of the learning experience, this learning environment endorses a generous use of transitional concepts as a fundamental tool to proliferative design diagramming.

Even the expected communicative struggle among different approaches is illustrated with a metaphor, a visual one, the so called «Iceberg Model» (Figure 2): it accepts as a matter of fact that most of the disciplinary competencies (the expert knowledge) just remains beneath the surface, largely underutilized or occasionally ignored, while only a small portion of them is clearly above the «sea level» and thus visible, understandable and usable by all researchers/students during their discussion. Such a visible thin coat is magnified by the use of «metaphors», as the «glossary» graphically represented in Figure 3 on the next spread.

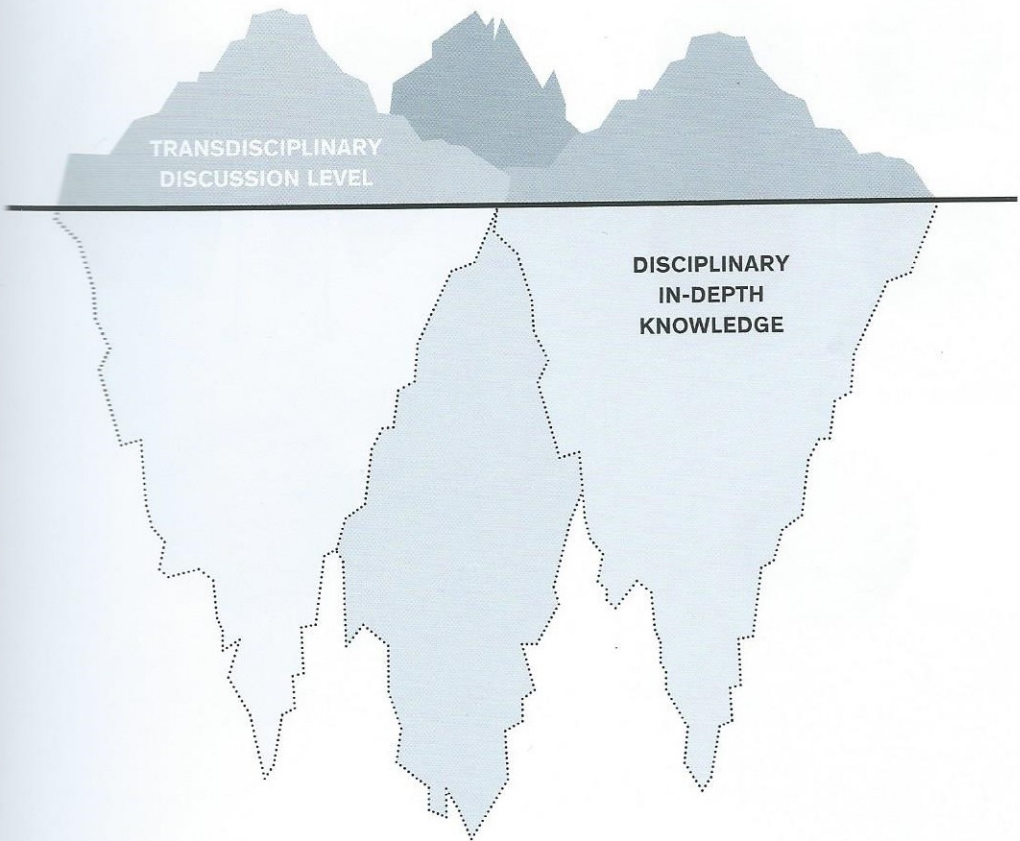
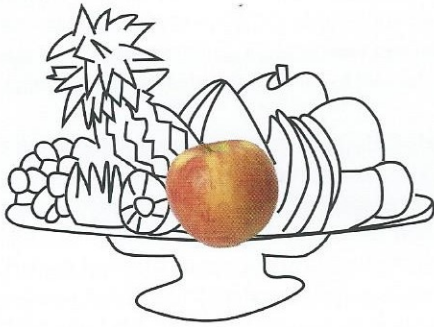
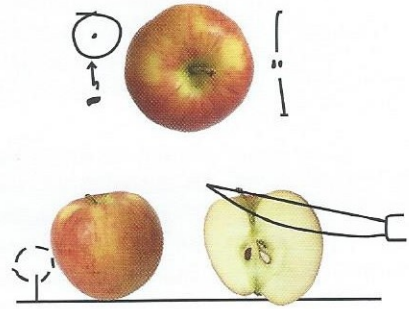


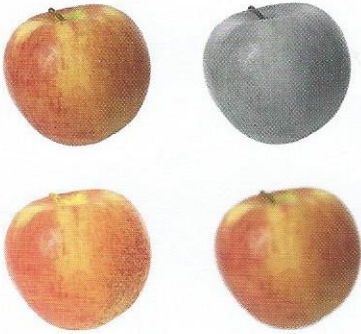
Figure 2: Transdisciplinary Competence and Disciplinary Depth (Iceberg Metaphor)



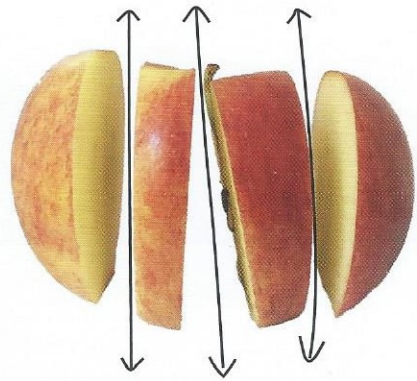
1. Context



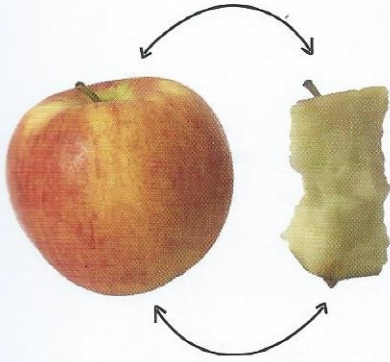
2. Drawing (Plan, Facade, Section)



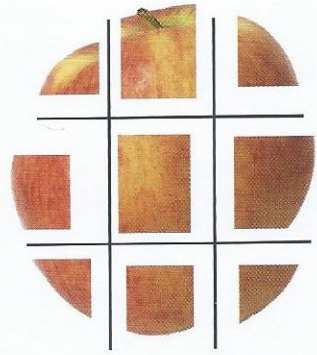
3. Atmosphere



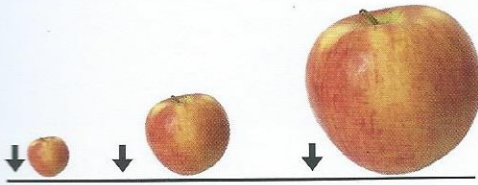
4. Permeability



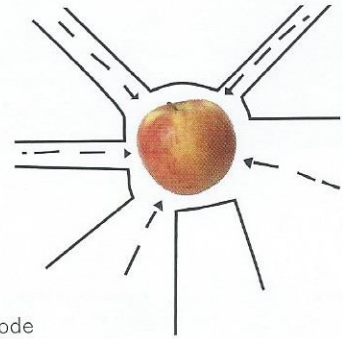
5. Sustainability



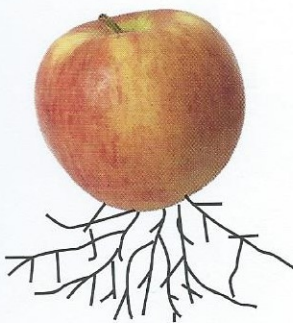
6. Program



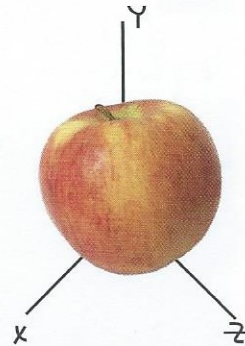
7. Scale



8. Node



9. Genius Loci



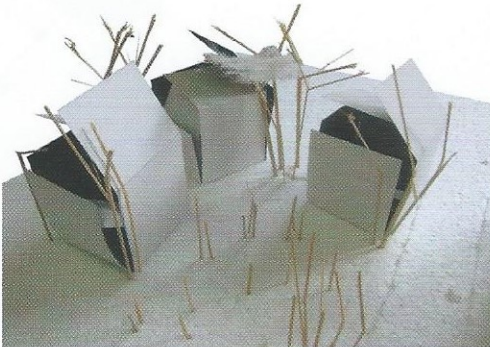
10. Axonometry

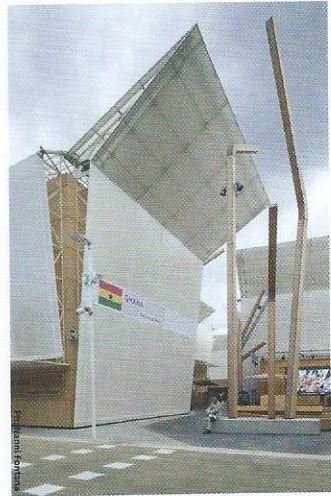
Figure 3:
Glossary Image (created by students of Tecnológico de Monterrey, Campus Querétaro)

The 2015 Milan Expo Cluster Design Workshop at the Politecnico di Milano, a hybrid academic/professional platform commissioned to prompt some tentative schemes for the Expo's Clusters, has been managing the design activity of a multidisciplinary team by applying similar techniques (Sequence of Figures 4-8).

The Milan Expo 2015 Cluster dedicated to the Cocoa products of emerging countries from Africa and Latin America depicts the «mise en scène» of some possible representations of processes, forms and stories associated with Cocoa. This cluster has been designed having in mind the «allegoric» image of the highly characterized landscape where the cocoa is actually grown: a tropical environment whose topographically complex ground is represented –in our project – by smoothly moving up and down a variety of gentle triangulated slopes. An environment featuring an invasive vegetation that vehemently emerges and strongly colonizes the space among the buildings, aggressing those buildings and compromising their static equilibrium and their geometry. At that point, the skin of the pavilions, a lightweight fabric that metaphorically protects the precious contents of Cocoa products, opens and unfolds, letting at sight the internal structures. The jungle trees, individually, in pairs or groups, are transfigured into poles or urban furniture systems, playing different roles: They define functional areas, they act as landmarks, they support the different levels of lighting or the speakers and they orient visitors into this vibrant magnificent artificial tropical jungle-plateau.

Figures 4-8: *Jungle Cocoa Cluster*, Expo Milano 2015, Fabrizio Leoni, Mauricio Cardenas, Cesare Ventura





Authors

Anne van der Graaf

Industrial Product Design Engineer, Professor at Windesheim University, Zwolle, The Netherlands

Christine Miller

Anthropologist, Clinical Associate Professor of Innovation, Stuart School of Business, Illinois Institute of Technology, Chicago, USA

Pius Leuba

Architect, Professor at Tongji University, College of Architecture & Urban Planning, Shanghai, China

Peter Bölsterli

Architect, Founding President at Boötes – Cultural Cooperatives, Hongkong

Mario Doulis

Designer and Sculptor, Professor at Merz Akademie, Stuttgart, Germany

Poul Kyvsgaard Hansen

Associate Professor, Department of Mechanical and Manufacturing Engineering, Aalborg University, Denmark

Magdalena Mateescu

Lecturer in Applied Psychology, University of Applied Sciences and Arts North Western Switzerland

Roberto Iñiguez Flores

Professor of Engineering Design, Dean Schools of Medicine, Architecture, Design and Computer Science, Tecnológico de Monterrey, Guadalajara, Mexico

Antonio Pita

Mechanical Engineer, Professor emeritus of Tecnológico de Monterrey, Mexico

Jeanette Beck

Architect, Office for Urban Planning, City of Bern, Switzerland

Jonathan Edelman

Designer, Professor in Mechanical Engineering and Visiting Associate Professor at Stanford University, as well as Head of Global Innovation Design at Royal College of Arts, London, UK

Kathrin Merz

Architect, Senior Lecturer at Bern University of Applied Sciences, Switzerland

Fabrizio Leoni

Architect, Professor of Architecture at Politecnico di Milano, Italy

Joost Bootema:

Professor for Visual Communication at Merz Akademie, Stuttgart, Germany.

Guy Lafranchi

Architect, Professor at Bern University of Applied Sciences, Switzerland

Key Portillo Kawamura

Architect, Ecole Polytechnique Fédérale de Lausanne, Co-founder of Studio Banana, Switzerland

Ton van Raamsdonk

Engineering Designer, Professor at HAN University, Arnhem, The Netherlands

Thomas Noller

Professor for Interaction Design and Media Spaces at Berliner Technische Kunsthochschule, Berlin, Germany

Christoph Fleckenstein

Designer, CEO IonDesign, Berlin

Raimund Erdmann

Designer, CEO Erdmann Design, Brugg, Switzerland

Armin Blasbichler

Artist, Architect, Professor at Institute for Integrative Design, Academy of Art & Design, Basel, University of Applied Sciences and Arts North Western Switzerland

Bernabé Hernandis

Industrial Engineer, Professor at Universidad Politécnica de Valencia, Spain

Herbert Schubert

Professor in Applied Management and Organization in Social Sciences at University of Applied Sciences, Cologne, Germany

About the Editor

After his doctorate in physics at ETH Zürich and studies in biomedicine at Stanford University, Christoph Holliger has worked in academia as a researcher and teacher for three decades. Based on his criticism of traditional educational models and on his belief in transdisciplinary collaboration, he established the international consortium POLE (Project Oriented Learning Environment), the network of universities in which students and faculty members work together across disciplinary and cultural boundaries on real-world challenges in co-operation with industry and corporate partners.

Aside from his passion at the universities, he works as a consultant for government agencies in Switzerland as well as in developing countries like Indonesia, Bolivia, Mexico and Poland. Christoph Holliger is also the founding director of Artec Design, a company that is engaged in the design of art in public space.

