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## Is it possible to teach how to design? What is the paradigm that encloses the theoretical and applicational-experiential spheres of the architectural discipline?

Architecture is a heteronomous discipline that finds its reasons in the hybridisation and contamination of different forms of knowledge. The training of the architect, as an intellectual and a technical professional, requires a deep and radical meditation on the foundations of educational programmes, the relevance of teaching models and learning tools. The Schools of Architecture represent the realm in which the student, in Louis I. Kahn’s words, is called to meditate on whatever is exchanged and on its utility. As a place for the learning, experimentation and testing of the most advanced techniques and tools of a discipline, the institutions must necessarily open their cultural and educational project to a critical dialogue, with the prospect of expanding their horizons and international exchanges. The School, as the ultimate seat for the production and transformation of knowledge, aims at training skilled graduates in the conception, design, construction and management of architecture, who are capable of handling the complexity of design understood as a synthesis of skills. The polytechnic approach is the key for shaping recognisable and specific professional competences, at the same time complementary and synergic, within an evolving professional and production scene that requires skills and tools aimed at networking, flexibility and dealing with change in the contemporary world. The dialogue between two brilliant institutions in the European context, sharing a polytechnic approach, the *School of Architecture Urban Planning Construction Engineering* of the Politecnico di Milano (AUIC) and the *Escuela Técnica Superior de Arquitectura* of the Universidad Politécnica de Madrid (ETSAM) provides an opportunity for meditation aimed at triggering an active and productive discussion about the methods and tools of teaching architecture.

ISBN 978-88-6242-486-8



9 788862 424868

Emilio Faroldi | Maria Pilar Vettori

TEACHING ARCHITECTURE  
TWO SCHOOLS IN DIALOGUE

edited by  
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EMILIO TUÑÓN ÁLVAREZ  
IGNACIO VICENS Y HUALDE

••••• LetteraVentidue



«The process is mutual;  
for men learn while they teach».

*Seneca*

ISBN 978-88-6242-486-7

First edition June 2020

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This volume was also published in Italian with the title “Insegnare l’Architettura”, ISBN 978-88-6242-441-7

English text editing: Antonella Bergamin

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LetteraVentidue Edizioni Srl

Via Luigi Spagna 50 P

96100 Siracusa, Italia

[www.letteraventidue.com](http://www.letteraventidue.com)

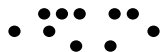
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## **APPARATUS**

by **Silvia Battaglia** and **Francesca Daprà**

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This book originates from the proceedings of the international seminar *Insegnare l'architettura. Due scuole a confronto* [Teaching Architecture. Two Schools in Dialogue], held at the Politecnico di Milano on November 23, 2018, and aimed at highlighting similarities and dissimilarities in terms of tools, educational methods and cultural approaches to architectural design in two of the main European Schools of Architecture. The seminar was attended by representatives of design culture and managers of educational programmes in the realm of architecture, from the *Scuola di Architettura Urbanistica Ingegneria delle Costruzioni* (AUIC) [School of Architecture Urban Planning Construction Engineering] of the Politecnico di Milano and the *Escuela Técnica Superior de Arquitectura de Madrid* (ETSAM) [Higher Technical School of Architecture of Madrid] of the Universidad Politécnica de Madrid. Without their active contribution, this book would not have been possible. The book intends to provide a first discussion on the significant work of review and update of the teaching-learning relationship in the architectural realm.

# PROLOGUE

Emilio Faroldi, Maria Pilar Vettori

«Teaching is a fortunate thing. Providing education is a gift, because you learn more than you teach».  
Alberto Campo Baeza, 2017

**I**s it possible to teach how to design? What is the core of the paradigm that encloses the theoretical and applicational-experiential spheres of the architectural discipline?

Architecture is a heteronomous discipline that finds its reasons in the hybridisation and contamination of different forms of knowledge. The training of the architect, as an intellectual and a technical professional, requires a deep and radical meditation on the foundations of educational programmes, the relevance of teaching models and learning tools. The Schools of Architecture, understood in a “Kahnian” sense as the realm in which the student is called to meditate on an object of cultural exchange and on its utility as a place for the learning, experimentation and testing of the most advanced techniques and tools of a discipline, must necessarily address their intellectual and educational project in a critical way with the prospect of expanding their horizons and international exchanges.

The School, as the ultimate seat for the production and transformation of knowledge, aims at training skilled graduates in the conception, design, construction and management of architecture, who are capable of handling the complexity of design understood as the highest synthesis of skills. The polytechnic approach is the key for shaping recognisable and specific professional competences, at the same time complementary and synergic, within an evolving professional and production scene that requires skills and tools aimed at networking, flexibility and dealing with change in the contemporary world.

The dialogue between two brilliant institutions in the European context, sharing a polytechnic approach, the *Scuola di Architettura Urbanistica Ingegneria delle Costruzioni* [School of Architecture Urban Planning Construction Engineering] of the Politecnico di Milano (AUIC) and the *Escuela Técnica Superior de Arquitectura*



of the *Universidad Politécnica de Madrid* (ETSAM) [Higher Technical School of Architecture of Madrid] provides an opportunity for meditation aimed at triggering an active and productive discussion about the methods and tools of teaching architecture.

Indeed, the School of Madrid, like the School of Milan, has always placed great attention on the relationship between design theory and practice. The statements of its most prominent members, combined with those of the main institutional representatives of the Politecnico di Milano and of designers/professors who play, even in an experiential form, a pedagogic and demiurgic role in such context, form a multi-voice narration that can highlight the theme of architectural design as an action at the same time intellectual and technical, since its conception tied to the sphere of buildability and founded on a deep building and technological knowledge, in relation with its tradition in the educational-training context.

The dialogue-discussion with the Spanish School highlights synergies and contrasts, complementarities and dissonances, overlaps and arrhythmias. The empirical observation of the professional and educational reality highlights the foundational value of an almost “artisanal” approach as the expression of a design poetics rooted in the classical values of our discipline and, at the same time, aimed at incorporating contemporary technological culture.

The interaction between theoretical production and design practice, the relationship between professional experience and educational activity in architecture, design practice as an opportunity for intellectual exercise, and the relationship with the building process, the commitment to the propagation of architectural theory and criticism as a continuation of the masters’ work, with an opening for personal considerations within a universal vision of architecture, profession, and the foundations, dictate its essence.

The resulting scenario offers coherent, although articulated positions, based on the educational value of the built work, the necessary commitment to the theorisation of the discipline’s principles, and the complexity of design interpreted as a synthesis of performance requirements, stylistic canons, established spatial poetics, and social needs. The success of such concept of architecture inevitably relies on the balance between material and immaterial, scientific and humanistic principles, technique and poetics.

When considered through a diachronic kind of interpretation, such position is not so unlike that expressed by Ernesto Nathan Rogers about the situation of the educational realm in 1959, in his editorial *Professionisti o mestieranti nelle nostre Scuole di Architettura?* In his opening article for the issue 234 of “Casabella-Continuità”, he expressed his critical distance from «too many low-level professors, still anchored to conformism (if not even reactionarism), to indifferentism (if not even fascism), to practicism, formalism, technicism», and pointed to the risk of a “school” that does not reflect life.

Rogers is in favour of the opportunity to develop and nurture a biunique and dialogic relationship with students, based on the need to keep the university in touch

«with the world outside the school, by tapping into reality». The goal is stimulating a fruitful dialogue between two contexts in relation with the adaptation of methods, tools, goals in the educational realm. At the same time, this entails the pursuit of new and updated ways of teaching, capable of capturing the changing circumstances of a practice characterised by an obvious cultural, instrumental and processual transformation.

In accordance with such scenario, the recent debate about the reorganisation of architectural studies led the Politecnico di Milano to promote a significant rethinking within its establishment, resulting in a structural development of its educational offer in continuity with its long tradition and, at the same time, characterised by significant renewal actions aimed at capturing the best of the contemporary situation and professional expressions.

The development of the *Scuola di Architettura Urbanistica Ingegneria delle Costruzioni* [School of Architecture Urban Planning Construction Engineering] of the Politecnico di Milano and the reorganisation of the Bachelor of Science and Master of Science Programmes is the result of a fruitful opportunity for meditation about what Le Corbusier defined as the «awkward question» of teaching architecture, within a dynamic and interactive dialogue between international scenarios and professional realms. Such action intervenes in a scenario of increasing uncertainty aimed at finding the best balance among timing, phases, disciplinary sequences, their relations and integrations, specific weights of the individual contributions – all the ingredients that make the scenario of the transmission of architectural codes and their related professions even more complex and delicate.

At the same time, stimulating dialogues among different cultural approaches to “teaching architecture” and providing it with means and strategies so that it can intercept the requirements of the contemporary condition is an activity that can no longer be postponed, particularly within the Italian context, due to its inherent values in terms of the relationship between territorial transformation and identity of places, although with a constant reference to the international scene, as this is now a crucial issue for the reorganisation of professions.

Internationalisation represents the strategic issue for a university that intends to address the deepest requirements of society. A transnational educational offer can only rely on principles of continuity. The history of the Politecnico di Milano in the sector of constructions and the heritage of the Milanese and Italian School of Architecture are the foundation for the development of a debate aimed at enhancing the disciplinary, cultural and social differences, all while strengthening networks and synergies at the local and global level.

Within the time-honoured process of integration into the international context promoted by the Politecnico di Milano, its School of Architecture plays a primary role. The establishment of Erasmus programmes, started since the very first years of the European mobility programmes, as well as of English-language Degree Programmes – for the Master of Science in *Urban Planning and Policy Design* and for

the Master of Science in *Architettura* [Architecture], later for the Bachelors of *Scienze dell'Architettura e Urbanistica* [Sciences of Architecture and Urban Planning] – fully represent an innovative vision open to experimentation.

The establishment of the new School, in 2016, is the result of a deep meditation and debate about the educational offer in architecture, urban planning and on the art of building, which synthesises the educational experiences developed within the three existing schools – *Architettura e Società* [Architecture and Society], *Architettura Civile* [Civil Architecture], *Ingegneria Edile Architettura* [Construction Engineering Architecture] –, as the carriers of alternative as well as complementary cultural and educational approaches, and the expression of different cultural and educational traditions in the polytechnic culture.

The reunification plan, resulting from the intention to enhance the vision of the three Schools, has emerged as a significant opportunity for dialogue and growth about the educational offer, in order to seize the opportunities offered by the different cultural positions, and to operate in the deep sense of the concept of “school”, understood, precisely, as a place where people «meditated on what was exchanged and on its relevance» (Louis Isadore Kahn, 1964).

As Ilaria Valente wrote in her application programme as Dean in 2016, the goal of «tracing a shared itinerary for reorganisation, capable of triggering a fruitful dialectics, in the awareness of the differences not only in terms of working traditions but also, and more importantly, of different skills» translates into the intention to train recognisable and characterised professionals, at the same time complementary and synergic, in the awareness that a polytechnic approach is now more than ever relevant in the face of a professional and productive scenario that primarily requires a readiness and the tools to promote networking in a flexible way and with an ability to manage change.

In this sense, the different cultural and intellectual positions that, in time, nurtured the “polytechnic culture” represent a highly valuable heritage: the integration of study programmes becomes strong and competitive as it condenses such shared resource. The establishment of the new School implies the definition of its facilities and of the operational powers of its governing bodies, the consultation of its related departments (DABC, Department of *Architettura, Ingegneria delle Costruzioni e Ambiente Costruito* [Architecture Construction Engineering and Built Environment]; DASTU, Department of *Architettura e Studi Urbani* [Architecture and Urban Studies]; DICA, Department of *Ingegneria Civile e Ambientale* [Civil and Environmental Engineering]) based on a shared and programmatic dialogue aimed at finding common goals and strategies in order to achieve those goals, by tapping into issues and positions coming from the three dialoguing realms.

The implementing rationale included two sequential, separated but coordinated phases: the first one involved the Bachelor programmes, initiated with the opening of the new School; a second, more recent phase called for the reorganisation of Master's Degree Programmes through a shared process of enhancement of existing

identities supported by the clear intention of updating second-level offer.

The teaching-learning relationship embodies the barometre of the conformity of transmission, of the ability to develop, in full awareness, a mature design synthesis interpreted as a central action of an accomplished teaching of architecture, through the autonomy of Bachelor programmes and, at the same time, their being preparatory for the following cycle.

The training of the architect, his social as well as technical role, requires a radical meditation on the foundations of the paths and educational tools, in light of the innovations in the design production framework in conceptual and instrumental terms (digitalisation, Industry 4.0, integrated processes), thereby confirming the requirement for coherence between thought and action typically characterising architecture.

The dynamics of modification of professional and job market frameworks, which also involve an extension of the reference boundaries beyond the national context, must find their foundations on the goal of providing a high critical and understanding ability of phenomena by enhancing the ethical and responsibility components, now more than ever necessary in order to face the challenge of complex social, technological, environmental changes. In such scenario, the School's ability to convey the "culture of design" understood as an ability to operate, through actions of synthesis aimed at enhancing different disciplinary contributions and addressing complex issues through an aware creative process, become highly relevant in the configuration of the designed framework.

Nowadays, addressing the city, built heritage, landscape, environment requires a multi-faceted vision that combines an ability to read problems and constraints with a mental openness to opportunities: an education that exceeds the boundaries of technical training and veers instead towards a culture of design that can successfully address the complexity of the contemporary age and the respect for the built heritage and the landscapes. The Italian context, with its typical structural issues, may represent a unique opportunity for a School.

In the face of a general horizon that pursues active and dynamic balances among anthropised environments, players of the processes, resources both available and to be preserved, the crisis in the construction sector should not be interpreted exclusively in its material boundaries – it should be rather approached as an opportunity for innovation and activation of new perspectives.

The unescapable difficulties of the public administration in dealing with territorial planning and management processes are the reasons for the waning attractiveness of study programmes related to such sectors. On the other side, however, they stimulate a radical rethinking of the educational offer aimed at innovation in terms of roles, methods and tools.

The gradual convergence of the Schools identifies the result of a complex and difficult process, which implied the questioning of established working models, and required the critical review of engrained experiences and cultural positions. Besides, the impact of the review of the regulatory system results in a general weakening of

the roles of the Schools and, at the same time, required the reconfiguration of institutional bodies such as the Departments in the face of new ways of programming, organising and managing the programmes and of the introduction of renewed processes of evaluation developed by the reform.

At the Politecnico di Milano, the work carried out by the “ICAR” Senate Committee, established in order to prepare the constitutional document of the new School, produced the activation, in order to complete the Bachelor’s Degree, of two inter-school programmes as the foundation of the architecture and construction engineering programme: *Progettazione dell’architettura e Ingegneria e tecniche per l’edilizia e l’architettura* [Architectural Design and Engineering and Techniques for Building and Architecture], based on a rethinking of the teaching of foundations in the world of architecture, building production and construction engineering. At the same time, the Urban Planning Bachelor’s Degree underwent a reconfiguration clearly expressed by its title – *Urbanistica: città ambiente paesaggio* [Urban Planning: City Environment Landscape].

In spite of often fragmented and critical processes, the work on the shared ground of the architectural discipline and the critical dialogue among the different developments of the polytechnic culture and of a School, the Milan School, that counted on the lesson of major urban planners and architects such as Piero Portaluppi, Ernesto Nathan Rogers, Franco Albini, Franca Helg, Lodovico Belgiojoso, Piero Bottoni, Aldo Rossi, Paolo Portoghesi, Vittoriano Viganò, Guido Canella, Marco Zanuso, tried to develop programmes aimed at training graduates with a deep knowledge of the historical and modern matrixes of architecture, by combining the cultural tradition of the sector with the disciplinary innovation of design.

The architecture student should be the carrier of the role of “civil service” that history assigned to the figure of the architect and that draws its principles from the richness of the educational offer understood as a cultural value related to its articulation and heterogeneity.

The reconfiguration of Bachelor’s degrees, emblematically symbolised by the inauguration of the *Progettazione dell’Architettura* [Architectural Design] programme between 2017 and 2018, completed the reorganisation of architectural studies at the Politecnico di Milano through the redesign of programmes concerning the two-year Master programme, reinforced by the consequent election of the coordinators of the programmes involved. The main goals pursued by the reorganisation process, as defined by the documents prepared by the School and by the coordinators of the study programmes, may be summarised with the provision of a clear educational offer, with reference to the Italian and the international context, of further development of the knowledge received with the Bachelor of Science in *Progettazione dell’Architettura* [Architectural Design].

Three main programmes, combining confirmed and new offers, were created: *Architettura – Ambiente Costruito – Interni* [Architecture – Built Environment – Interiors], *Architettura e Disegno Urbano* [Architecture and Urban Design],

*Architettura delle Costruzioni* [Building Architecture]. These are complemented, within the School, by eight more MScs again related to the realm of architecture, construction engineering and urban planning: *Urban Planning and Policy Design*, *Architectural Design and History* (in Mantua), *Sustainable Architecture and Landscape Design* (in Piacenza), *Ingegneria dei sistemi edilizi* [Engineering of building systems], *Building and Architectural Engineering* (in Milan and Lecco), *Management of Built Environment/Gestione del Costruito*, *Landscape Architecture*, *Land Landscape Heritage*, *Ingegneria Edile Architettura* [Construction Engineering Architecture] (in Lecco with a five-year programme).

To remain in the context of the Milan metropolis, or of the programmes developed within the Leonardo Campus in Milan – it should be remembered that the School also offers courses and programmes in the Territorial Poles –, in order to define its dimensional entity, it may be noted that the *Architettura – Ambiente Costruito – Interni* [Architecture – Built Environment – Interiors] programme accepts up to 440 students; the *Architettura e Disegno Urbano* [Architecture and Urban Design] programme also accepts up to 440 students; the *Architettura delle Costruzioni* [Building Architecture] programme has 150 students. Therefore, a significant overall number of 1,030 students sign up every year for Master's Degrees in architecture in the Milan Campus. This figure reflects the year when such programmes were inaugurated, and a value gradually stabilised in the following years.

The result of the deep process undertaken in order to achieve a reorganisation of architectural studies in Milan is a clear structure that proposes the figure of the designer architect aware of the modification of the condition of design, in the international context, all while protecting and enhancing our history, in synch with the universality of a discipline and the teaching of its masters.

Burdens and honours combine in the practice of a profession – the teaching profession – that increasingly, in the absence of reference points for the young generations, plays an ethical and civic role of primary importance in continuity with the statement Ernesto Nathan Rogers made during his speech at the Politecnico di Milano on April 4, 1963 when, not without difficulties, he obtained the chair after years of unsuccessful trials: «considering the chair as a pulpit from which a sort of authoritative verb of truth descends is alien to me, as I, instead, consider that my task is ennobled by the possibility of participating, with more responsibility, in the life of the School by identifying with my assistants and with all the students in a constant dialogue of exchange. [...] This gives me the opportunity to renew myself and therefore to keep on learning. And no nourishment is more invigorating than the one coming from young people».

Therefore, *Teaching architecture* intends to represent a platform of thought and study aimed at discussing the issues of architectural education as an unavoidable practice of fusion of experiential actions and critical-theoretical vision by starting from the narrations of some protagonists of the world of architecture and its transmission.

Conferment of the Honorary Master's Degree in Architecture to Álvaro Siza Vieira, Scuola di Architettura e Società [School of Architecture and Society], Politecnico di Milano, October 16, 2013.



Aldo Rossi in his office. Fotografia di architettura © Federico Brunetti.





Alberto Campo Baeza  
at Villa Adriana,  
Rome, March 18,  
2018. Photo by  
Emilio Faroldi.




Emilio Faroldi  
meets Aldo Rossi e la  
città Analoga, work  
presented at the  
Biennale di Venezia in  
1976. Mantua 2018.





Il Preside della Facoltà di Architettura del Politecnico di Milano  
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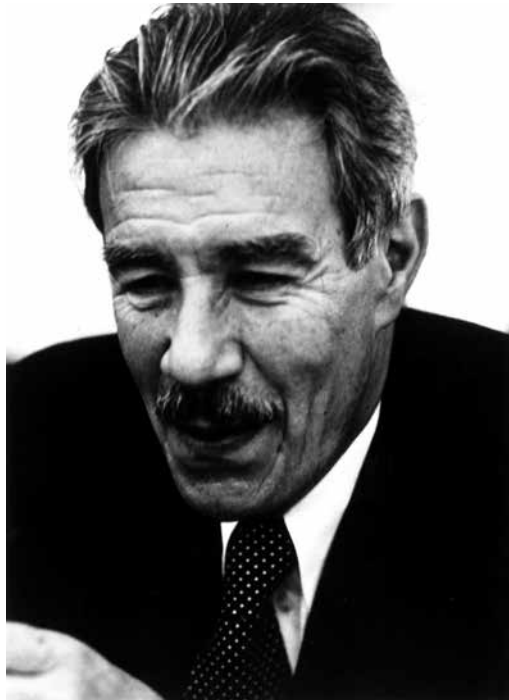
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 Architettura* [Faculty  
 of Architecture],  
 Politecnico di Milano,  
 May 21, 1991.



Guido Canella,  
 Portrait. Photo by  
 Fabrizio Ruffo.



Ignazio Gardella, Self-portrait. Photo by Renzo Chiesa

arch. prof. Lodovico B. Belgiojoso      Via dei Chiostri 2 - 20121 Milano - tel. 02/86463085 - fax 02/8052070

Carissimi  
Vi ringrazio moltissimo per l'invio  
dei "Dialoghi di architettura".  
Mi sono reso conto del ritardo  
essendo stato fuori a fare un business  
in un periodo di riposo.  
Brave auguri  
all' Ludovico Belgiojoso

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Lodovico B. Belgiojoso, Letter sent to Emilio Faroldi and Maria Pilar Vettori on the occasion of the publication of the book *Dialoghi di Architettura*, 1995.

Note to the essays:

The titles of Universities, Schools, Departments, Study Programmes are spelled in the original language in order not to alter their meaning.

The translator of the volume is responsible for the translation of quotations not derived from editions of volumes in the original language.

# ESSAYS

# TEACHING ARCHITECTURE

Emilio Faroldi

**T**he dichotomy between theory and practice, notion and application, knowledge and technical skill is what defines the specificity of the architectural profession. Such rhetorical opposition triggers the discussions and agendas of Schools of Architecture, which cyclically question themselves about the specific weight of the two components, the methodologies most adequate to their transmission and the changes in the professional scene the educational path should point to in order to update its structure.

Educating the young generation to architectural disciplines is an ambitious and arduous task, even more so in an age when the speed of information and the ease in absorbing a wide range of notions tend to weaken the teacher-student relationship in favour of other ways of retrieving forms of knowledge placed in other realms and in different physical dimensions.

The reproduction of technical and specialist skills complicates the transmission of the action of synthesis that, by definition, characterises the task of the teacher as a source of guidance and experience.

In the currently topical thematic realms that characterise the context of the teaching/learning relationship within the architectural disciplines, the teaching activity cyclically and clearly emerges as a noble and irreplaceable action – a practice that now requires a process of critical review and actualisation of its methods, even through an international discussion interpreted as a trigger of debate.

Indeed, teaching is one of the oldest and at the same time most delicate practices within human activities – a strategic action for the creation of a widespread and aware culture as the foundation of a stable and progressive civilisation. “Teaching architecture”, similarly to other disciplinary realms that hinge around man and his behavioural model, implies far from common attitudes.

Indeed, professors and teaching assistants must be able to offer a balanced combination of widespread, rarely only specialist skills, along with particular pedagogic qualities.

In his famous text, *If I had to teach you architecture* from 1938, Le Corbusier mentioned a «sense of control, unbiased judgement»<sup>1</sup> the teacher should constantly encourage, by stimulating the student to always question himself about the «how» and the «why» of gestures and choices he pursues. The teacher must assist, stimulate, correct, and support the technical and creative development of design, by ensuring that the two souls exist side by side in a balanced form with none prevailing on the other.

The education of young architects exceeds the mechanic transmission of technical skills. The student needs to receive notions that can be used skillfully, and adequately, by avoiding the acritical pursuit of an approach aimed at a fruitless and instrumental self-referentiality. The contemporary architect should be prepared to become a figure that can address a palimpsest of requirements by combining different skills, which intersect in multiple layers, as the expressions of heterogeneous disciplines and articulated combinatory modalities.

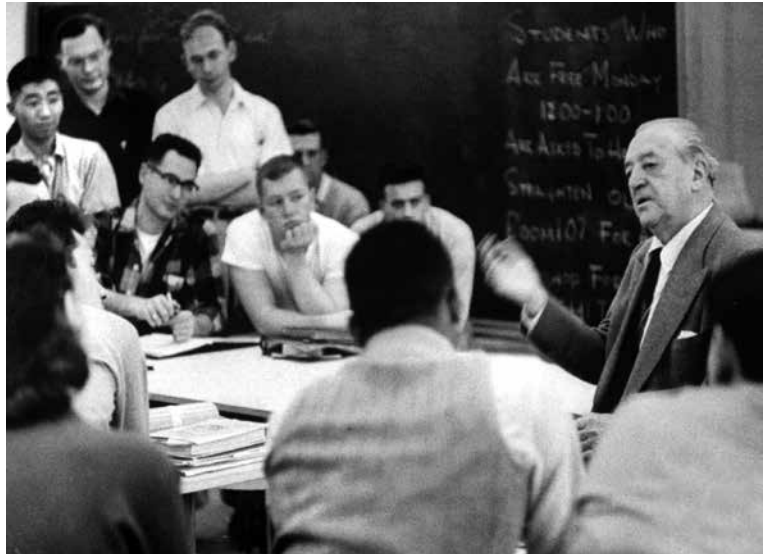
«The achievement of architecture requires a remarkable autonomy in judgment, a certain assuredness in choices. All of these things must be learnt along with the design disciplines»<sup>2</sup>.

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1. LE CORBUSIER, *If I had to teach architecture? Rather an awkward question...* in "Focus", 1, 1938, London; It. ed. *Se dovessi insegnarvi architettura? Davvero una domanda difficile...*, in "Casabella", 766, May 2008, pp. 6-7.

2. MONESTIROLI Antonio, *Cari studenti*, in PUGLIESE Raffaele, SERRAZANETTI Francesca, BERGO Cristina, *Sperimentazione o dell'architettura politecnica: origini e sviluppi della cultura moderna dell'architettura nella ricerca e nella didattica al Politecnico di Milano*, Maggioli, Santarcangelo di Romagna, 2013, pp. 350-354.

Ludwig Mies van der Rohe. «True education is concerned not only with practical goals but also with values».



Education should encourage such attitudes and convey values, as Mies van der Rohe stated in his famous inaugural address as director of the Architectural Department of the Armour Institute of Technology in Chicago, again in 1938.

Therefore, educating to the pursuit of applied and professional goals, as well as, and more importantly, educating at the high meanings in the cultural realm and in the critical sphere. «True education – Mies underlines – is concerned not only with practical goals but also with values. By our goals we are bound to the specific structure of our epoch. Our values, on the other hand, are rooted in the spiritual nature of man. Our practical aims measure only our material progress. The values we profess reveal the level of our culture»<sup>3</sup>.

A central role of education is preparing the future designer to acquire a critical conscience and a democratic sense in the assessment of the phenomena that occur in the realm of individual experience, in order to translate them eventually into systemic and objective actions.

“Teaching architecture” implies more than a “giving” – it is also about “receiving”, in a mutual relationship of exchange and

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3. MIES VAN DER ROHE Ludwig, *Discorso iniziale da direttore del Dipartimento di Architettura all'Armour Institute of Technology*, later IIT, Chicago, November 20, 1938, [It. trans. in BLASER Werner., *Mies van der Rohe Lehre und Schule Principles and School*, Birkhäuser, Basel and Stuttgart, 1977]; or MIES VAN DER ROHE Ludwig, *Sull'insegnamento dell'architettura*, in “Casabella”, 767, June 2008, p. 4; eng. ed. *Teaching and value*, in “Casabella”, 767, June 2008, p. 4 .

cooperation. In an age when the student is “easily distracted” and less capable of focusing, it is necessary to activate updated strategies in order to revive the lost *pathos* of teaching.

«[...] He ought, therefore, to be both naturally gifted and amenable to instruction. Neither natural ability without instruction nor instruction without natural ability can make the perfect artist. Let him be educated, skillful with the pencil, instructed in geometry, know much history, have followed the philosophers with attention, understand music, have some knowledge of medicine, know the opinions of the jurists, and be acquainted with astronomy and the theory of the heavens; [...]» This is the thought of Vitruvius, drawn from Chapter I. The Education of the Architect in his *I Dieci Libri dell'Architettura* [The Ten Books of Architecture].

The discussion about learning architecture, the organisation of its teaching and the skills a young trainee should acquire in order to practice that profession has very old origins, from Vitruvius to Alberti. The authors of treatises speculated about the need to expand or specialise the skills of students, therefore meditating on the “method” rather than just on the “result”.

Since 1919 – or since the foundation of the Bauhaus School established by Walter Gropius and few others – the world of architectural education has been questioning itself about its tools, according to which the process of training the “modern” architect results from the synthesis of humanistic-artistic values and technical-scientific disciplines.

A solid integrated knowledge provides the ability to address such complexity in terms of process and product, of which architecture has taken responsibility, in order to solve the challenges of the contemporary age in terms of use of resources and of framing the issues of an increasingly multi-ethnic and multi-cultural civilisation.

At the same time, the critical conscience one acquires by learning complex systems reaches the awareness that the discipline of architectural design is best equipped at addressing the solution of scale problems and of articulated and multi-faceted levels of complexity.

Therefore, it is necessary to develop an educational path based on the human sciences, concerning the geographical-social, historical-critical, linguistic-expressive aspects, and relying on exact sciences for the logical-mathematical, geometric-descriptive, physical-constructional aspects, by operating an autonomous





Architecture is a both intellectual and physical process. The architecture office in an age when designing was a physical, sensorial, global exercise.

combination of different paradigms.

In such context, the architect is increasingly required to play an intellectual role in the governance of material processes.

«Learning – the acquisition of the capacity to continuously learn – continues to be concentrated, in my view, in drawing – in learning how to see, to understand, to express – and in history – in the sense of gaining knowledge of the present in a state of becoming. – The learning of construction – of the capacity to construct with others – cannot be separated from Architecture, so there should not be different disciplines, but if anything converging ones, in constant awareness of the fact that no creative act can be separated from the materiality of its realization. – No idea of opposition between landscape (perception and construction of the territory) and object (fragment of the territory) has any place in the teaching of Architecture»<sup>4</sup>.

The evident fragmentation and independent specialisation of forms of knowledge and skills should be opposed in favour of

4. SIZA Alvaro, *Sulla Pedagogia*, in “Casabella”, 770, October 2008, pp. 3-6; eng. ed, *On the pedagogy*, in “Casabella”, 770, October 2008, pp. 3-6.

a marked ability in terms of critical judgment and dialogic and collective understanding of phenomena.

Indeed, a professional figure, adequately trained through a wide-ranging approach, is more easily equipped to address “unforeseeable”, “exceptional” events and to solve complex problems, never encountered before for their scale and articulation, as such professional can rely on approaches that successfully prevent the risk of the unforeseeable.

Consequently, the task of the Schools of Architecture today is training well-prepared architects who can address a diverse range of problems, inherent in an expanding scenario of environments and situations. For his culture and history, the architect ideally still represents a “generalist” rather than a “specialist” professional.

For too long, such debate has remained within the walls of the individual institutions or Schools that, although committed to laudable and innovative experimentations, have been unable to trigger a properly coherent and positive meditation about architectural teaching. Now, instead, there are positions that promote the dialogue and discussion among the pedagogical approaches of international Schools of Architecture, with reference to methods and tools concerning the relationship between “teaching” and “learning” spheres, and in turn originate from the changing approach to study applied by the new generations.

As Aldo Rossi states, «I consider design as a necessary condition for the education of an architect; [...] teaching architectural design means teaching a defined system with which one can address and solve problems; I recognise there can be different systems and that their comparison and the debate they provoke may be useful, but I am convinced that the only serious way out of our current situation is by offering everyone a design system»<sup>5</sup>.

After years of carelessness, resulting from an overrated consideration of the concept of “independent student”, the role of the teacher as a mentor and trainer has regained its centrality.

The 2018 edition of the Venice *Biennale of Architecture* devoted a section to the so-called “Practice of teaching”, in a way that considered the mutual benefit and advantage established between teaching and practice of architecture. Several association

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5. ROSSI Aldo, *La formazione del nuovo architetto*, unpublished typescript, 1966, in Archivio MAXXI Architettura/Fondo Aldo Rossi/Faldone 2/Fascicolo D2/1 from FLORENCIA Andreola, *Architettura Insegnata. Aldo Rossi, Giorgio Grassi e l'insegnamento della progettazione architettonica (1946-1979)*, Doctoral Dissertation, Alma Mater Studiorum Università di Bologna, a.a., 2014-2015, p. 136.



and research bodies address this issue and several Schools of Architecture question themselves on the nature of architectural education, thereby pursuing local and international dialogues, in order to address innovation in teaching and learning of the disciplines hinging around the realm of architecture.

Likewise, the *Association of Architectural Educators* working in the United Kingdom has promoted the theme of “education to architecture” for years, in a context in which students increasingly view themselves as “consumers” rather than as “receivers” of education. Such increasingly widespread attitude places the student in a different and more removed position from the teacher than that of the pupil, who is interested in learning the best of what university and academy can offer.

Questioning what currently makes an educational experience in architecture proactive, and pursuing the best ways to achieve a vital learning with a consequent successful design approach is fundamental.

The origin of such vitality is closely related to the methods of transmission and acquisition of knowledge, aimed at promoting participated experiences between teacher and student. As a universal language of Anglo-Saxon origin puts it, this is experiential learning, interdisciplinary knowledge sharing, collaborative study. Such activities prepare students to the experiences of cooperation they will encounter in their profession, within collective creative frameworks alongside the traditional frontal transmission of disciplines, in order to overturn the perspective of a closed and often deaf academic approach.

The practice of “distance learning”, now a forced necessity due to the catastrophe that hit our lives and habits, is also part of such context. In the future, it may represent a resource alongside traditional education, in a perspective of proactive innovation.

A culturally strong architecture cannot represent merely a functional device – it must be able to adapt by anticipating and guiding change, the unexpected and the unforeseen.

Technical skill, professional culture and knowledge cannot be the only ingredients for an architecture worthy of such status. In such context, the question of the quality of teaching, an issue long discussed within the international conferences and workshops organised by the *European Association for Architectural Education* seems to be another important element.

Besides the transmission of skills and methodologies typical of education and pedagogy, what does quality of teaching mean

Charles-Édouard Jeanneret-Gris, aka Le Corbusier, or the embodiment of Architecture.

Josef Albers teaching at the Department of Design of Yale University, of which he was Director during the 1950s, after he fled Nazi Germany.



Eduardo Souto de Moura and his students. Lecture at Teatro Bibiena, MantovArchitettura, Mantua, May 9, 2017.

exactly? How can we achieve such “quality” in the face of the multiple skills we have to convey, which often reduce the School to a provider of specificities, each with its own methodologies, at the same time devoid of a common vision?

The increasingly large presence, in our Schools, of professors and students from other physical and cultural contexts of the architectural world provides the unique opportunity to get in touch with innovative systems of teaching and learning, in a review of the phases, timing and players of the “design table”. The contribution of figures that provide hands-on experiences, typical of the architectural profession, and essential for the training of an updated professional figure can only represent a benefit.

The recent concept of “School”, introduced by the legislative system, incorporates and provides an increasing level of autonomy for Degree Programmes. Such process should crystallise into an increasingly wide and shared collegial participation in order to overcome an old-fashioned vision based on scientific-disciplinary sectors, thereby interpreting the “differences” as a key stimulus for the discussion of contents, in opposition to a fruitless number-based alchemy relying on training credits as a tool of discussion.

The choice to be made, in any action of review of educational projects in order to develop coherently an adequate professionalism for future architects should provide an option of continuity and consolidation of the path already traced, so that its inspiring principles may be confirmed.

As argued by Eduardo Souto de Moura, «The school, instead, is and must remain School, promote and propose possible, concrete exercises in an exciting and interesting game that any architect should be able to experiment, at least in a phase of his life, and that can lead to no other place than that. The school must be realistic and, at the same time, imaginative, unreal. [...] I think we can only teach through the practice of drawing and the constant experimentation of architecture by the teacher, with his students at his side. I think there is not just one way to explain design, but that each professor, each architect must apply his own method and pay attention to the aspects he considers relevant. The student will become convinced of the soundness of his master's method through practice and develop his own critical position by either choosing or refusing his design guidelines and operational strategies»<sup>6</sup>.

This should not be understood as a passive revival of a pre-established model but rather as the expression of a mature and explicit understanding of our heritage, in a way that can materialise in an updated design, developed as the successful combination of the best experiences. A revival and a consolidation that can enhance the identity of the matrixes of architecture through a shared critical meditation that draws its concrete approaches to a changing action from a reality that requires innovation in terms of content, form and spaces.

Within such logic, the spatial innovation of educational facilities becomes a key strategic aspect that should be redesigned: “educational facilities” and “quality of education” are clearly closely connected.

Indeed, university has always been recognised as the most accomplished educational and training institution: similarly, the relationship between university and urban context has played a primary role in the policies for the management and development of the city. In Italy, the first universities were created far from cities according to a vision that understood advanced education

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6. SOUTO DE MOURA Eduardo, *A scuola con Eduardo Souto de Moura*, MAFFIOLETTI Serena, (ed.) FrancoAngeli, Milan, 2018, pp. 62-63.

and research as functions separated and separable from progress and life in the urban context.

While, on one side, the isolation of the university settlement from the vital core of a constantly growing city ensured, with its physical independence, a stronger dedication to study and research, on the other side it decentralised the flows of students and university staff, in the attempt to restrict the interaction and possible short circuits with the city context.

Nowadays, city and university have deeply changed: the gradual physical development of anthropised contexts has gradually reached and finally absorbed the oldest university seats originally built out of the urban boundaries.

In its current new phase of economic development, the city increasingly needs the university as a driving engine for the innovation and revival of its economic and business fabric through culture.

As facilities specifically devoted to the teaching and training of young people, Universities have experienced a constant increase in their research and experimentation activities, through development models that are all the more successful when they result from a close relationship with the system of business, institution bodies and other university centres.

The role of universities within the city is that of a primarily important urban player that can trigger and develop regeneration and both urban and social renewal strategies.

Conversely, the university is osmotically dependent on the city and the services it can provide – the current tendency of academic institutions at opening up towards an increasingly wide and international catchment area requires the infrastructural, environmental, commercial, service and leisure facilities typically found in a city. The university institution is one of the main strategic hubs at the territorial level through which the city may open and widen its boundaries in order to reach a global knowledge market. It is the formal seat of the production and propagation of knowledge and of cultural and technical information; it is a catalyst of human capital; it is an active player within the realm of technological transfer policies; it is a point of connection with the global research, innovation and development networks.

University is an integral and crucial part of the city, as the city is an integral part of the fabrics that come to life in university campuses. As such, these two realities merge and mutually integrate with no distinction of value between them.

The Politecnico has recently undertaken a new challenge related to the improvement of the quality of its facilities both in terms of education and of social and service programs for the users who currently view the university as a welcoming place where they can spend the entire day and more. Multimedia, interaction, sharing, flexible use, socialisation of data and information. These are the new frontiers of a design education that must promote its own form of teaching in a way that simulates reality as closely as possible in order to bring the debate back on the “goals”, and not just on the “means”, and prevent the risk of focusing discussion exclusively on issues related to a fruitless instrumental skill.

Within such scenario, the quality of teaching, research and spatial resources clearly and obviously interact in terms of synergic complementarity, in a way that can mutually enhance the relationship between city and university.

The *Vivi.Polimi* project that I am honoured to coordinate since 2017, currently represents one of the main actions the Politecnico has promoted in terms of the synergies among quality of spaces, quality of life, quality of research-training. More specifically,

*Il Giardino di Leonardo*, Campus Leonardo, *Vivi.Polimi*, Politecnico di Milano, Milan, 2019. Photo by Marco Introini.





*Agorà degli Studenti,*  
Campus Leonardo,  
Vivi.Polimi,  
Politecnico di Milano,  
Milan, 2019. Photo by  
Emilio Faroldi.



*Vivi.Polimi* is a strategic project aimed at updating the quality of work, research, education spaces of the Politecnico di Milano within an international vision increasingly open to the dialogue between university and city.

Improving the quality of spaces in our Campuses and academic institutions means increasing the quality of life in the district where the Politecnico has resided for over one century: after years of specific interventions, the programme now aims at providing a unified plan for the Campuses, their history and their future.

Studying and working at the Politecnico is an element of pride for the entire polytechnic community: living the Politecnico is a sensorial as well as an educational life experience, which pursues the best models for an increasingly successful action also connected to the educational activity. The working group comprises professors and architects who put all their passion and team spirit in a daily effort aimed at providing the University with enjoyable spaces capable of catering to the requirements and habits of students.

In the wake of history and tradition, looking back to our history but more importantly forward to the future, *Vivi.Polimi* tries to intercept the requirements and spatial needs of the new generations.

At the same time, the construction of the new Architecture Campus, resulting from an idea of Renzo Piano and with his cooperation, lays the foundation for an increasingly efficient relationship between quality of spaces and quality of the educational action.

“University is city” is our motto: starting from such premise and confirming the notion that the city is the primary stage for human life, meditating on the goals, instruments, forms of teaching the discipline – architecture – that more than others addresses in a complex form its determination, evolution and controlled planning, represents a defining action for the creation and training of a new generation of architects and intellectuals who will represent the main authors of a cultivated and innovative design of the places and spaces for human life in the near future.



Art and Architecture.  
Luca Faroldi, Miguel Quismondo, Emilio Faroldi, Stefania Mossini, Alberto Campo Baeza, Manuel Blanco Lage, during a visit to Villa Borghese, Rome 2018. Photo by Luca Faroldi.

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## FOR AN ARCHITECTURAL KNOWLEDGE

Alberto Campo Baeza

«To see a World in a Grain of Sand  
And a Heaven in a Wild Flower,  
Hold Infinity in the palm of your hand  
And Eternity in an hour».

William Blake, 1863

**E**very year, at the beginning of the course, I repeat these words by the English poet William Blake to my students, as I believe they encapsulate the intentions I try to convey through my design lessons.

When Emilio Faroldi, one of the most renowned professors of the Politecnico di Milano, asked me to discuss education and design, and what is the essence of design, I questioned myself about what it means to teach design. Teaching (in Italian *didattica*, from the Greek *didaskein* means teaching, educating, explaining and providing reasons).

But, what does it mean precisely to teach architectural design?

I cannot even remember how many times I wrote a detailed programme about the issues my design lessons would address, and how many times I abandoned the order of the lesson I had prepared and, instead, I improvised, on the spot, through a more intense and effective design critique.

A lesson, particularly a design lesson, cannot merely apply schemes that, although perfect, are unable to “move” the students.

As an experienced anatomy professor, my father always repeated, «when the heart isn't moved, the ischium moves instead», the ischium being the bone in the lower part of the pelvis.

Although my morning lessons at the School of Architecture are supposed to end at 14:30, my students listen so carefully that I, feeling dead tired, often end up asking what time it is, and they breezily answer it is 15:15.

“They always trick me”, but it is a trick that, actually, is more of a compliment, a way for them to tell me they want to stay longer.

Teaching: in other words, conveying the knowledge we absorbed, and studied ourselves in our time. Educating, or displaying the design process in order to understand it better, and encourage the students to understand it too.

Performing a “design critique” means providing explanations and reasons, looking for and finding the reasons for which a project sees the light. It means trying to find and explain such reasons with clarity.

Reason, again, emerges as the main protagonist of architectural design. As architects, we must be aware of and be able to provide the reasons that lead us to build our designs; as professors, we must teach and look for and find always the reasons leading to the solutions for the different issues our projects raise.

Teaching design is not a vague and undefined activity that attracts the students around a professor, as a sort of guru, and lights the “fire” of enthusiasm. Besides a desired enthusiasm, the student needs to find someone who is always ready to provide the reasons for creating and analysing a project.

Obviously, architecture is fascinating, and being an architect means practicing the best profession in the world. The goal is never following a whim but an in-depth study of all the elements inherent in the “architectural fact”, in order to develop a project through reason, with the help of imagination, memory, knowledge. A true research work.

### **Teaching to fish**

How many times we professors have repeated that “teaching architecture” is like teaching to fish? Not by giving fish but by teaching to fish. Our task is not to solve the student’s project but to provide him with the skills required to adopt the necessary instruments so that he is able to figure it out, and develop a project with plausible and explainable reasons.

The task of the professor is not acting as an advisor who takes the student by the hand and leads him to the solution he considers most appropriate. When I daily

address my 150 students, I realise that this is the lesson – a more general and wide-ranging lesson that can reach all the 150 students – I have to offer so that it can be efficient for everyone.

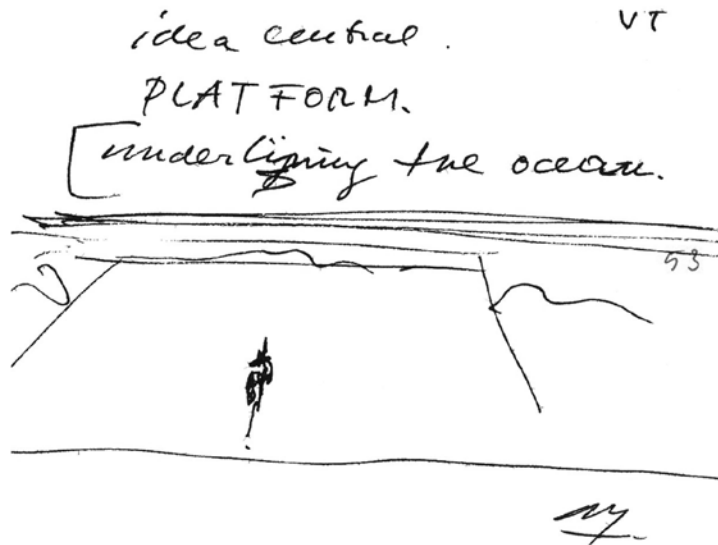
Professors and assistants help to achieve such work as they can and must establish a particular relationship with each student – teaching design is research in the most scientific sense of the term.

### Tools

I decided to focus the programme of the next academic year on the study of the mechanisms of architecture, which represent an efficient tool to translate spatial ideas. The knowledge of such mechanisms – tools – is more than beneficial – compression *vs* expansion, stereotomic *vs* tectonic, the cave and the hut, diagonal space, double-height space, the horizontal place that becomes a line when it is at eye's height, isotropic space, symmetry *vs* balance, and many more.

I think it will be a good programme.

Clearly, we cannot neglect the issues of gravity, which defines the construction concepts of space, of light that builds time, of architecture as a built idea, and then place, context, materials and many other issues.



Alberto Campo Baeza,  
House of Infinite,  
Cádiz, 2014.  
Design sketch.



This is architecture – rich, complex, made of a host of aspects, always aware that on one side are the ideas, and on the other side are the mechanisms, the instruments, the tools, which turn it into a concrete material.

Maria Pilar Vettori,  
Alberto Campo Baeza,  
Emilio Faroldi, Madrid  
2016. Photo by  
Francesca Daprà.

### **The sleep of reason produces monsters**

Goya was onto something when he painted *El sueño de la razón produce monstruos* [The sleep of reason produces monsters]. He repeated: «imagination [...] united with reason is the mother of the arts and the source of our wonders». Not bad as an educational proposal. Teaching should take its cue precisely from such double register of reason and imagination.

As professors, we must prepare our lessons and establish the criteria required to analyse and criticise the projects with as much rigour as possible. And such work must be done by using reason.

At the same time, we must be able to get our students to dream, we must excite them, convince them that building dreams is possible.

And this work must be done by using imagination.

Reason as a starting point and beauty as a goal.

### **Knowing, being able to teach, being willing to teach**

I quoted and wrote countless times about what Julián Marías, the great Spanish philosopher and a follower of Ortega, proposed as the three conditions one has to achieve in order to be a good teacher: “knowing”, “being able to teach” and “being willing to teach”.

*Knowing.* We professors must always study. In order to increase our knowledge day by day. In order to fill the pit of wisdom. With the satisfaction resulting from the fact the more knowledge you acquire, the more knowledge you can convey.

*Being able to teach.* It is useful to learn and practice efficient teaching methods. We all have our personal tricks, our recipes, in order to capture the attention of students and convey what we want to teach.

*Being willing to teach.* Devoting our life to teaching. Devoting more hours than the time required by the School. It is exhausting but worth it.

### **Michele Silvers International Award 2013**

This essay about education made me think about the project for the Degree Thesis presented at the School of Architecture of the Politecnico di Milano by Tommaso Campiotti, Paolo Volpetti and Tommaso Certo, which obtained the highest honours and additionally received the prestigious *Michele Silvers Award 2013* for the best thesis completed abroad.

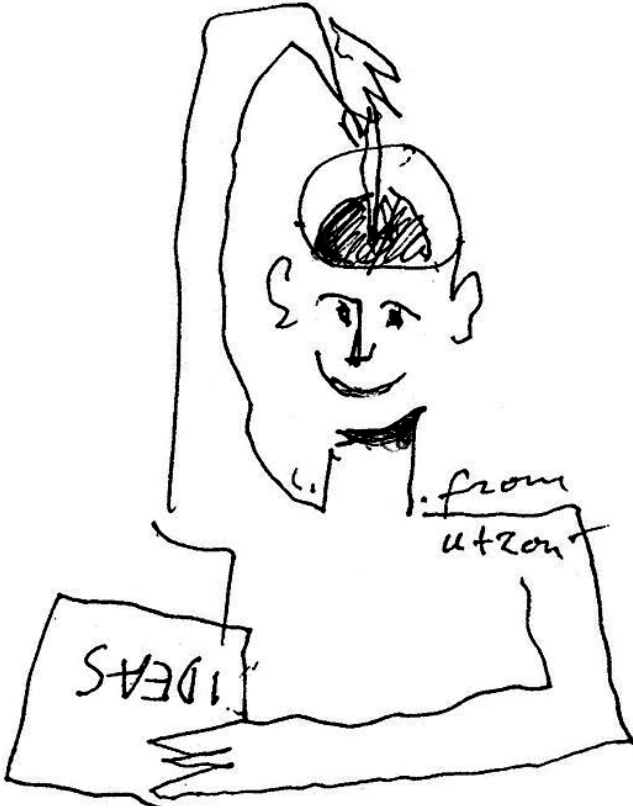
I had the honour to serve as co-supervisor of this project with Professor Emilio Faroldi. The theme addressed by the project was a library in Madrid, in Plaza del Rey. The three Italian students came to see me in my office every week in order to review their thesis – an exemplary process and work.

Tommaso Campiotti was also my student at the Erasmus programme as well as my assistant, for 4 years, at the design programme, with brilliant results.

I have to recognise that the Italian students who came to Madrid over the last few years, in particular those coming from the School of Architecture of the Politecnico di Milano, are of the highest level, and reflect the high quality of teaching and designing in Italy.

### **Education is not the filling of a pail, but the lighting of a fire**

The advantage, or disadvantage, we recognise nowadays when we use Word to write on the computer is that each text remains open to possible alterations, corrections or additions. For this reason, I am adding this note.



Alberto Campo Baeza, sketch that reinterprets Jorn Utzon.

«Education is not the filling of a pail, but the lighting of a fire». This statement, this invitation is attributed to the poet William Butler Yeats.

Evidently, some attribute it to Plutarch, others to Aristophanes, given the effectiveness of the statement. This message brilliantly summarises my argument in this essay.

#### **N.B.**

There are some texts that I have recently recommended to my students and cannot keep myself from proposing here.

*Le Meditazioni* [Meditations] by Marcus Aurelius. Wonderful. Originally written in Greek. Now this is the book I always have on my bed table and never tire of reading. Among other things, in Book I (I, 15), writing about Claudius Maximus, his master, he says, «no man could ever think he was despised by Maximus, or ever venture to think himself a better man».





Final critique with:  
Scott Paden, Cedric  
Scharrer, Adam  
Bresnick, Alberto  
Campo Baeza,  
Richard Wesley and  
Hisao Kojama, at the  
Furness Library,  
Pennsylvania  
University,  
Philadelphia, 1999.

*Saint Augustine's 23 recommendations to the youth of the IV century.* An altogether timely work. I printed the recommendations on a sheet of paper and I put them on the back of my copy of Marcus Aurelius' book. One of the 23 recommendations states, «recognise your flaws and try to amend them».

Finally, I could never forget the words of Louis Sullivan who, besides being a magnificent architect, was an excellent professor, a master: «you cannot create unless you think, and you cannot truly think without creating in thought».

We must be aware that what we do as architects is pursuing beauty. I used the title *Relentlessly seeking Beauty* for my inaugural speech at the San Fernando Royal Academy of Fine Arts.

In addition, last year, I dared to propose the introductory lecture precisely about beauty. At a certain point, I even thought it was too ambitious: instead, the result was wonderful. All the students perfectly understood that the origin of architecture is reason but its goal is beauty.

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# TRADITION AND PERSPECTIVES OF THE SCHOOL OF ARCHITECTURE OF THE POLITECNICO DI MILANO

Ilaria Valente

«All of these lessons will be completed, then, with many researches [...] about the architecture most adequate to our age and to Italy; thereby opening the way to reason, without forcing it onto one path, and particularly encouraging students to pursue practical exercises».

Camillo Boito, 1861

**T**he meeting with ETSAM provides a first opportunity for meditation about the tradition and the general architectural education system in Polytechnic Schools, a useful and fruitful dialogue that deserves to be activated and intensified, at least in the European context. Polytechnic culture, in Europe and in the world, unfolded with peculiar characters in the different situations and, within such culture, the history of the Schools of Architecture has promoted the dialectic between the academic and the technical-scientific approaches typical of polytechnic schools, in the constant dialogue between artistic and technical practices.

## Between Academy and Polytechnic

The history and structure of the School of Architecture of the Politecnico di Milano result from a double matrix, the polytechnic matrix and the matrix of the Academy of Fine Arts of Brera.

The Politecnico di Milano, or rather the Higher Technical Institute, as it was named at its establishment in 1863, resulted from the requirement, expressed in Italy and in Lombardy since the first half of the nineteenth century, of reorganising the entire higher, in particular technical-professional education system, due to the increasing industrialisation process. The new institutions established in Milan, including the Società di incoraggiamento d'arti e mestieri, in 1838, and the Istituto Lombardo di Scienze lettere e arti, along with some periodicals like "Il Politecnico", played an active role in the debate of the time<sup>1</sup>. As early as 1851, before the unification of Italy, Francesco Brioschi, Felice Casorati and Enrico Betti travelled to

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1. See LACAITA Carlo G., *Il Politecnico di Milano*, in AA. VV., *Il Politecnico di Milano. Una scuola nella formazione della società industriale 1863-1914*, Electa, Milan, 1981, pp. 9-36.

Germany and France in order to visit their polytechnic schools. With the annexation of Lombardy to Piedmont, in 1859, just before the birth of the national State and with the Casati law of the same year, which would represent the foundation for the reformation of the Italian educational system, the promotion of scientific and technical study programmes was a clearly acknowledged requirement. Later on, in 1862, Carlo Cattaneo, addressed the government of unified Italy about the requirement of new higher technical studies «following the analytic method of positive sciences».

The Royal Higher Technical Institute of Milan was established in 1863 as the «Italian translation of the German Technische Hochschulen»<sup>2</sup>. Unlike what happened in other Italian universities, Brioschi, in establishing the Higher Technical Institute of Milan, created three special schools, or “departments”: one for civil engineers, one for mechanical engineers, and a third one for the training of teachers of natural and mathematic sciences for secondary schools.

A fourth department was created in 1865 for “civil architects”, «by associating the scientific and technical disciplines of the Institute with the artistic disciplines of the Academy of Fine Arts of Brera, in order to create a real school of modern architecture, then still missing in Italy»<sup>3</sup>. The goal was creating a School «that would train a new kind of professionals, equipped with more than an accurate artistic education, and also capable of making calculations, using new materials, relying on the application results of the different scientific disciplines for the construction of buildings

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2. «The abstract theory imparted in the physical-mathematical faculties of the medieval University of Pavia must be flanked (rather than replaced) by the new independent institute where teaching is above all practical and dedicated to those applied sciences that best respond to contemporary economic and social conditions», in FONTANA Vincenzo, *La Scuola speciale di architettura (1863-1915)*, in AA. VV., *Il Politecnico di Milano...*, cit., p. 231.

3. LACAITA Carlo G., op.cit., p. 14.

(housing, schools, industrial and rural buildings, railway stations, etc.) required by civil life in a Country like Italy that, after political unification, would swiftly go through the stages of economic and social development, according to an optimistic view of the time»<sup>4</sup>. Between 1865 and 1908, the “department for civil architects” was chaired by Camillo Boito, who had been the director of the Accademia di Brera [Academy of Brera] since 1861, and guided its development in a decisive manner. «Opening the old Brera Academy to architecture and civil engineering students», an idea developed by Brioschi and Boito, shaped a figure of architect basically independent and different from that of German polytechnic schools, where architecture was «an applied art, complementary to construction technique, and therefore a discipline required for the training of civil engineers». For Camillo Boito, architecture was “a higher art, a synthesis of science and art, a “useful” art, as it was «most necessary in a democratic society like ours, [...], the highest among industrial arts», as it was «in the middle, and reached out to both sublime art and applied art»<sup>5</sup>.

While the establishment of the Istituto Tecnico Superiore [Royal Higher Technical Institute] of Milan, later to become the Politecnico di Milano, is firmly rooted in the construction of the “new Nation”, the Special School for Civil Architects is even more involved in such process, considering the commitment of Boito and of Milanese architects to the pursuit of the “national style”. At the same time, Boito’s educational programme looked out to contemporary European researches and developed a practical approach to teaching, by encouraging «drawing professors to start from simple volumes – cube, cylinder, sphere – and then move on to plans and sections, and get the students to practise on models, traditionally the safest method to assess the project in the three dimensions. The plans should be corrected according to the discipline of distributive characters, the economy of materials is the “truth” of Ruskin [...] or of the first part of *Les Entretiens* by Viollet-le-Duc [...] who during the same years tried to reform the Beaux Arts in Paris»<sup>6</sup>.

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4. Ibidem.

5. BOITO Camillo, *Questioni pratiche di belle arti*, Milan, 1893, cit. in Fontana Vincenzo, op. cit.

6. FONTANA Vincenzo, op. cit., p. 232.

The difference between engineer and architect, however, was still indistinct and much debated in those years<sup>7</sup>. In fact, the Special Scuola Speciale per gli Architetti Civili [School for Civil Architects] still maintained a dichotomy between architecture professors coming from Brera and the professors of technical-scientific disciplines employed by the Institute. The same dichotomy applied to students. Such situation would result in a long process of reorganisation of the relationship between scientific and artistic disciplines<sup>8</sup>, culminating in the subdivision of studies in a two-year preparatory programme mostly devoted to technical-scientific disciplines, drawing, descriptive and projective geometry, and a three-year special programme – a structure typical of the entire Polytechnic.

Later on, in the three-year specialisation programme, Boito's lessons focused on the history of architecture, «architectural adequacy and comfort», and the styles<sup>9</sup>. Other disciplines addressed by this programme included free-hand drawing, a first classical style project, survey campaigns. Besides composition, the programme included perspective and interior decoration lessons. Boito also introduced the teaching of restoration theory, the very first architectural programme of this kind in Europe<sup>10</sup>.

### **Tradition, practice and experimentation**

The Special School for Civil Architects became an independent Faculty in 1933, within the process of establishment of Faculties of Architecture in Italy<sup>11</sup>, and Gaetano Moretti, a graduate from the Brera Academy where he had worked with Boito, became its dean. Piero Portaluppi, one of his students, would succeed him in 1939 and would retain the post of dean until 1963, except for a hiatus immediately after the war.

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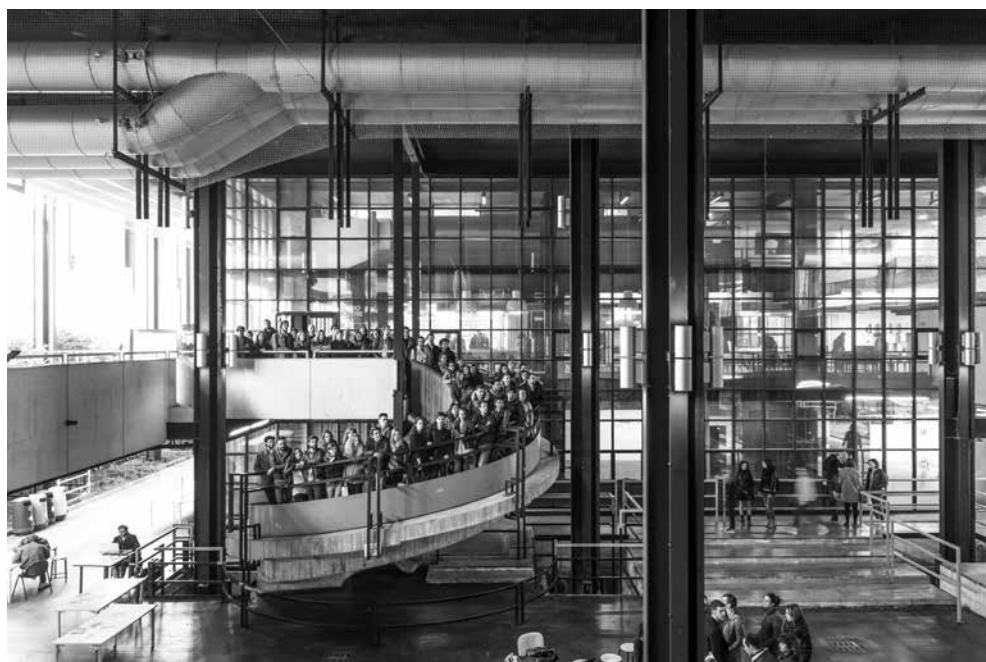
7. Boito himself states: «It is good to say what else is an engineer if not another architect? But the distinction in Italy is either unclear, or in some regions such as Lombardy and Piedmont, is in fact back in favor of the former, also for what concerns monuments and architectural buildings ...», cit. in FONTANA Vincenzo, op. cit., p. 240. In 1885, the Ministry established schools of architectures at the academies of fine arts of Florence, Rome and Naples.

8. See SELVAFOLTA Ornella, *L'Istituto tecnico superiore di Milano: metodi didattici e ordinamento interno (1863-1914)*, in «Il Politecnico di Milano, 1863-1914», cit.

9. FONTANA Vincenzo, op. cit., p. 234

10. Ibidem. See also AA. VV., *Camillo Boito Moderno*, SCARROCCHIA Sandro (ed.), Mimesis Edizioni, Milan, 2018.

11. LORI Ferdinando, *Storia del Politecnico di Milano*, Tipografia Cordani, Milan, 1941. About this issue, see also D'AMATO Claudio, *La Scuola Italiana di Architettura, 1919-2012*, Gangemi, Rome, 2019. The first Faculties of Architecture in Italy were in Rome, Florence, Venice, Naples, Turin, Milan and, since 1944, in Palermo.



Vittoriano Viganò,  
*Facoltà di Architettura*  
 [Faculty of  
 Architecture]  
 of the Politecnico di  
 Milano, Milan 1985,  
 The patio and its  
 spiral staircase.

The structure of the School would follow a clear path in the following year with the achievement of an effective balance between technical-scientific disciplines and the disciplines related to composition, history, restoration, interior architecture and decoration.

The *Tecnica Urbanistica* [Urban Planning] programmes, introduced in 1929, were taught by Cesare Chiodi, at the Engineering Department, and by Giovanni Muzio at the Architecture Department. These were the very first urban planning programmes in Italy, at a time when the new urban planning law was under discussion. In the same years, Piero Portaluppi was equally involved in a research about the city: in his *Composizione Architettonica 2* [Architectural Composition 2] programmes and in his writings he advanced the hypothesis of the «city as an architectural artefact»<sup>12</sup>. Later on, in 1935, the teaching of urban planning would benefit from the contribution

12. See ROSTAGNO Chiara, *L'insegnamento dell'Urbanistica al Politecnico di Milano attraverso le carte dell'archivio Luigi Dodi. Dall'istituzione agli anni del confronto (1929-1966)*, "Annali di storia delle università italiane", 12, 2008, pp. 193-206; LACAITA Carlo G., cit.; BIANCHETTI Cristina, *L'urbanistica al Politecnico di Milano: insegnamento e professione (1929/1963)*, in "Territorio, Rassegna di studi e ricerche del dipartimento di scienze del territorio del Politecnico di Milano", 9, 1991, pp. 5-34.

of Luigi Dodi (who would be the dean of the Faculty between 1963 and 1966), followed by Morini in the 1960s. Such rich research and educational environment would later benefit from the contribution of remarkable protagonists of Italian urban planning, including Giuseppe Campos Venuti, from 1968 to 2001, and Bernardo Secchi, who would act as dean from 1976 to 1982, and would also offer programmes in the realm of *Planning*, with Piercarlo Palermo, dean of the *Facoltà di Architettura e Società* [Faculty of Architecture and Society] from 2002 to 2012.

Therefore, the realm of city studies emerges as a relevant concern for the School of Milan, explored from two different perspectives: architectural design and urban planning.

In the after-war period, Ernesto Nathan Rogers introduced the issue of “pre-existing environmental conditions”. Two of his students, namely Aldo Rossi with *L'Architettura della città* [The Architecture of the City] and Vittorio Gregotti with *Il territorio dell'architettura* [The Territory of Architecture], wrote two “foundational” essays for the theory and practice of architectural design, in the Italian and international context, in the last three decades of the twentieth century.

Since its establishment, professors and graduates of the School of Architecture have played an active role in the construction and transformation of the city of Milan and of Lombardy at large: Boito himself and his students, including Giuseppe Pirovano, Giovanni Giachi, Carlo Formenti,

Luigi Broggi and Luca Beltrami, developed important civil architecture works.

The circumstances of twentieth century architecture and of modernism in Milan interweaved with the life of the School. Its students were major protagonists. Giuseppe Terragni built five stunning houses in Milan and worked at the design for the enlargement of the Brera Academy, while Figini and Pollini were members of the Gruppo 7 and, along with Piero Bottoni, attended the IV CIAM Congress. During the war period, Gio Ponti taught interior architecture, as did Franco Albini, before becoming full professor of Composition.

In the period immediately after the war, during the 1950s until the early 1960s, several exponents of modernism in Milan became professors at the Politecnico di Milano, including Camus, and later Gandolfi, Belgiojoso, Ernesto Nathan Rogers, Cerutti, Viganò, De Carli, Bottoni. Several professors were members of the MSA (*Movimento Studi di Architettura* [Movement of architectural



studies]), a group that, along with the magazines of the time, was part of the discussion about the Modern heritage and the future of Milanese and Italian architecture.

Ernesto Nathan Rogers was first the editor-in chief of “Domus”, between 1946 and 1947, and then of “Casabella-Continuità”, between 1953 and 1965. The structure of programmes was still quite traditional but the discussion about the tasks of architecture and the School was intense, as testified by the essay published by Rogers already in 1944 about this topic – *Problemi di una Scuola di architettura*<sup>13</sup>. The early 1960s marked a turning point, accelerated by the protest of students and by the occupation of the Faculty in 1963. The main concern of that new phase was bringing architectural design at the centre of teaching, since, up to that time «only 6 out of 34 fundamental programmes, not counting the complementary programmes, were directly about architectural design, and therefore perceived by the students as having particular traction on the entire five-year educational path»<sup>14</sup>. At the same time, there was a generational turnover in the academic staff.

This phase in the history of the School coincided with the beginning of a markedly experimental approach to the teaching of architecture, which would strongly affect the following years. It is necessary to remember that the professors committed to teaching in those years were also responsible for a season of intense construction of the city also resulting from a booming economy.

Rogers, Belgiojoso, Albini, Franca Helg, Antonio Piva, Eugenio Gentili Tedeschi, De Carli, the young Aldo Rossi, Guido Canella, Vittorio Gregotti, Marco Zanuso, and Liliana Grassi (chair of restoration between 1964 and 1971). The years between 1966 and the early 1970s were marked by the protest movement and by a continuing effort towards educational experimentation in the Faculty<sup>15</sup>.

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13. Later published in ROGERS Ernesto Nathan, *Esperienza dell'architettura*, Einaudi, Turin, 1958, pp. 73-79.

14. Aldo Castellano describes the «long and frantic process of educational experimentation that started in 1963 and never stopped, although since the 1990s the central government rather than the universities has dictated the agenda». CASTELLANO Aldo, *Cultura architettonica milanese e rinnovamento della Facoltà di Architettura tra anni Cinquanta e Sessanta*, in “Annali di storia delle università italiane”, 12, 2008, p. 263.

15. See AA. VV. *La rivoluzione culturale. La Facoltà di Architettura del Politecnico di Milano 1963-1974*, Seminario di Laurea in Storia, Critica e Rappresentazione del Progetto di Architettura, Proff. I. Balestreri, G. Barazzetta, M. Biraghi, O.S. Pierini, (Facoltà di Architettura Civile, Politecnico di Milano, 2009); AA. VV., *Occupanti. Gli esordi della moderna Facoltà di Architettura nelle fotografie di Walter Barbero*, LEVI DELLA TORRE Stefano e PUGLIESE Raffaele (eds.), Alinea, Florence, 2011.



Design education at the Politecnico di Milano, Milan, "Thinking with your hands".

In the following period, the Faculty would have to address the issue of a growing number of students and, particularly during the 1990s, adapt its programmes to the reforms promoted by the national governments and to the Bologna Process.

As a major school, the *Facoltà di Architettura* [Faculty of Architecture] of the Politecnico di Milano offers the presence of several prestigious teachers and a vibrant dialectics among positions that emerged during the debate in the postwar period and the 1960s, often with opposite approaches to design and the role they view for it in education.

The articulation and contrast of such positions shaped the subdivision of the Faculty of Architecture. A second Faculty of Architecture established in 1997 as *Facoltà di Architettura Civile* [Faculty of Civil Architecture], at the new Bovisa Campus, would be directed by deans Antonio Acuto, Antonio Monestiroli and Angelo Torricelli, while the Faculty of Architecture at the Leonardo Campus would be directed for a long time by dean Cesare Stevan, later succeeded by Piercarlo Palermo who would change its name into *Facoltà di Architettura e Società* [Faculty of Architecture and Society].

Since the 1990s, there has been a differentiation in some study programmes, until then related to the role of the generalist architect. In 1993, the Faculty established the first *Disegno Industriale* [Industrial Design] Programme in Italy, followed, in 2000, by an independent *Facoltà del Design* [Faculty of Design], complemented by *Urbanistica* [Urban Planning], *Pianificazione Territoriale* [Territorial Planning] and *Ingegneria Edile Architettura* [Construction Engineering Architecture] Programmes.

Ilaria Valente and Eduardo Souto de Moura in the classroom in Milan, 2018. Photo by Emilio Faroldi.



### **A new educational project**

Between 2013 and 2016, a unification process of the three Schools – *Architettura e Società* [Architecture and Society], *Architettura Civile* [Civil Architecture], *Ingegneria Edile Architettura* [Construction Engineering Architecture] resulted in the establishment of the *School of Architecture Urban Planning Construction Engineering*. The project of the new School addressed the consequences of the crisis in the construction sector, as well as the difficulties of public administration in dealing with the planning and territorial management sectors, with the parallel and consequent waning attractiveness of study programmes in such realms, a scenario that remains critical in Italy. However, after *Expo 2015* the city of Milan showed a marked inversion of such trend so that its Universities are now key players in a particularly lively urban context. This factor certainly contributed to the reputation of the Politecnico di Milano and of our School in Europe and in the world.

The “Cultural and Educational Project” underlying the AUIC School, developed in 2015, pursues three major goals. The first is training «graduates skilled in the specific realm of design and construction, who can responsibly address the issues presented by reality at several levels and on different questions – from building to interior space, from the city to the territory, landscape, and the cultural heritage». The second goal is nurturing the central role of design «viewed, in its unity, as the synthesis of

multiple forms of knowledge» and the connection between such practice and the foundational principles of the polytechnic culture, for the «education of graduates who can synthesise the different disciplines that responsibly contribute to projects for the transformation of the physical environment». The third goal is activating the School as «a seat for the production as well as the propagation of knowledge, as dictated by the role of anticipation and cultural development traditionally played by the University [...] as a point of reference in a process of deep change that requires important contributions in terms both of the definition of new professional roles, and of innovation processes that can restore competitiveness, as well as defining a turning point in terms of the quality of the future habitat»<sup>16</sup>.

Such goals characterise the AUIC School within the Italian university system also in terms of number of attending students, thereby shaping an innovative educational system and, at the same time, placing it in a peculiar “bridging” space among the European and international polytechnic schools.

The School intends to keep on nurturing a deep meditation about the role and revival of the architect, the urban planner, the construction engineer, the landscape architect as designers that will be required to address the current accelerated dynamics of change of the profession and of the labour market both in the national and in the international context. We are facing a marked fragmentation and specialisation of skills, the gradual change of work tools resulting from the digitalisation and acceleration due to the development of immaterial communication networks, with major consequences even on the spatial reorganisation of cities and territories.

Given such fragmentation, the School has undertaken a process that promotes design culture as a ground for generating new syntheses and perspectives in order to offer Degree Programmes and train young architects, urban planners, engineers and construction specialists, landscape designers with a firm foundation in terms of the skills they have acquired, open and creative in their work, capable of addressing future challenges as designers, equipped with a strong critical ability so that they may practice their profession with culture, ethics and responsibility in a rapidly changing world.

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16. Scuola di Architettura Urbanistica Ingegneria delle Costruzioni, *Progetto culturale e didattico*, 2015.

In a densely and extensively built country like Italy, where environmental and hydro-geological issues are on the rise, curbing land consumption, as well as the protection of the architectural, artistic, landscape heritage are priorities, only the reconstruction of a design culture and of a cultivated and aware professional class may contribute positively to a qualitative development of our territories.

The School has the ambition to act as an incubator of advanced and high-quality proposals in such respect; at the same time, our tradition and expertise provide an excellent environment for qualified international students.

The School's educational offer revolves around design culture as a foundation and a goal. The three Bachelor programmes offered by its three departments (*Progettazione Architettonica* [Architectural Design], in the campuses of Milano Leonardo, Mantua, Piacenza; *Urbanistica: città ambiente paesaggio* [Urban Planning: Cities, Environment & Landscape], *Ingegneria Edile e delle Costruzioni* [Building and Architectural Engineering]) are designed to offer firm foundations and tools.

The master-level educational offer necessarily addresses a more complex and articulated scenario. The very first issue is how to train future architects who are able to tackle emerging problems and challenges – new modes of home living to the role of architecture, and of the architect, within the frame of major metropolitan contexts in the world; how to build within built fabrics, environmental and social sustainability, climate changes, the restoration and protection of architectural and landscape heritage. In the articulation of Master architecture programmes, we chose to pursue a generalist but focused approach, in the articulation and intersection of disciplinary contributions, in the development of tools and skills required to address such issues. The result is the articulation of five Master's Degrees in architecture, all meeting the EU requirements, in Milan with three Programmes: *Architettura – Ambiente Costruito – Interni* [Architecture – Built Environment – Interiors]; *Architettura e Disegno Urbano* [Architecture and Urban Design]; *Architettura delle Costruzioni* [Building Architecture]; in Mantua: *Architectural Design and History*; in Piacenza: *Sustainable Architecture and Landscape Design*. In Lecco, an additional five-year programme is available in *Ingegneria Edile Architettura* [Building and Architectural Engineering].

The five Master's Degrees in Architecture are complemented by the Master Programmes for specialised professionals in

*Urban Planning and Policy Design, Landscape Architecture. Land Landscape Heritage, and, in the engineering realm: Ingegneria dei Sistemi Edilizi [Engineering of Building Systems]; Building and Architectural Engineering; Management of Built Environment.*

Therefore, the School trains a set of cooperating professionals and offers the opportunity to exchange experiences and cross-pollinate knowledge among students of different programmes. The common ground is the interpretation and perspective vision of polytechnic culture in the dialectics among the departments of the School: architecture, urban planning, landscape architecture, construction engineering. These are nurtured by specific disciplinary traditions, variously involved with humanistic knowledge and artistic practice, straddling cultural declination and design practice, exercise of technical rationality and specialist applications, as different ways of addressing and responding to specific needs and requirements and to the complexity and global nature of phenomena. The development of an appropriate multi-disciplinary context is a challenge for the education of cooperating professionals, in the awareness that the construction process, the processes of transformation of landscapes and territories increasingly rely on the integration of skills and techniques featuring varying degrees of advancement, innovation and experimentation, and variously articulating the

The Central Library of Architecture of the Politecnico di Milano, inaugurated on November 4, 2008 in via Ampere 2 and modernised in 2019. On the back wall: the wall painting of Guernica, made by the students in 1968.



The Gallery of Design of the AUIC School, Politecnico di Milano. The exhibition was *VV100 A come Architettura: una retrospettiva*, 2019.



features of design, product and process.

Therefore, the School, in synergy with the research developed in the Departments, becomes the place where the foundations and the tools of arts and techniques otherwise dispersed in specific specialisation come together and are explored.

### **An open and international School**

The articulation of the programme into 3+2 years of study, although in the required five-year duration prescribed for architectural education, has been and is the tool through which the mobility of the student population has emerged at a both national and international level. For several years, or since 2006 with the first programmes in English, the School of Architecture has initiated an ever-increasing activity of internationalisation, particularly at the Master level. Currently, international students, coming from over 30 different countries, account for about 30% of Master Programme students, and several visiting professors contribute to our programmes every year; at the same time, an increasing number of students participate in exchange programmes. The School is currently the common ground, the hub of relations and design and cultural development for professors and students of different origins. Multi-cultural openness is an important perspective that provides an original view of the dialectic between the tradition

of the School and the “fragments” of different identities and cultural traditional that contribute to our educational project. Our graduates will establish their roots in many different countries. Given such scenario, the networks hopefully established among the Schools of Architecture of Polytechnic Schools, starting with Europe, play a strategic role in terms of designs, dialogue, shared educational experiments, which will certainly shape a renewed identity for the architect, capable of working in the world, although firmly rooted in excellent work tradition, and ready to address future changes and challenges.

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# TEACHING ARCHITECTURE AT THE *ESCUELA TÉCNICA SUPERIOR DE ARQUITECTURA* ETSAM OF THE UNIVERSIDAD POLITÉCNICA DE MADRID

Manuel Blanco Lage

**A** dialogue between two of the main Schools in Europe requires a meditation about who we are and our mission in this world now venturing into the new millennium.

The ETSAM (*Escuela Técnica Superior de Arquitectura de Madrid* [Higher Technical School of Architecture of Madrid]), or the School of Architecture of the Universidad Politécnica de Madrid, boasts a long history and our architecture studies are probably the oldest. There is a precise historical reason for this – on one side, King Philip II of Spain's belief that "Architecture" was an indispensable element for the creation and development of a modern state and, therefore, that it was necessary to regulate the education of architects. So it was that Juan de Herrera, the architect who built El Escorial royal palace for the king, his masterpiece, introduced architecture programmes among the disciplines of the recently established Real Academia Matemática, an institution designed to provide a scientific education to the best technicians of the time.

Such decision, made in 1582, is, so to say, our birth certificate. The repercussions of this far from secondary event have resonated down to our days.

Ever since its origin, Spanish architecture was never considered merely as one of the Fine Arts. Indeed, the origins of our School are not in the Academia de Bellas Artes, an institution that, by the way, was established precisely by architects. Instead, they date back to the birth of an Academia Matemática Técnica that, under the aegis of mathematical disciplines, allowed us to understand the principles and make the calculations required to achieve an adequate construction of buildings.

Clearly, this does not mean that structural calculation, as we know it today, was already practiced at a time when architects usually worked with "trial-and-error" methods and by trying to understand how the experience of construction would

allow for new models. We rather intend to underline how, since the beginning of our programmes, the technical realm of architecture was viewed as just as fundamental as the artistic realm and how such idea of the profession led our country to reserve all architecture-related activities to architects only. In a European perspective, we are architects and at the same time civil engineers, as well as the only professionals responsible for the “architectural fact” in all its dimensions.

In 1625, our studies passed under the control of the Colegio Imperial, established by the Jesuits from their old school, and within which architects would remain for about one century, until, in 1746, after repeated requests, mostly precisely from architects, the Real Academia de las Tres Nobles Artes was established. It included architecture, painting and sculpture – the three professions directly connected to the production, creation and decoration of architecture. This academy started to offer architecture programmes and, in 1757, was authorised to grant the first official title of Architect. The Real Academia continued to offer architecture programmes until 1844, when the new Escuela Especial de Arquitectura was established as a specific institution where architecture studies were available separately from the education provided by the Academy.

This was the actual birth of our current School. In 1857, the Moyano law about public education established the School’s complete autonomy and finally defined its current model.

Therefore, our origins also include the Real Academia de Bellas Artes, although starting with programmes held before its creation, for which architects played a very important role.

Belonging to a tradition that pre-exists the birth of the institution we work in at present is a situation that also applies to our current University.

Indeed, the Universidad Politécnica de Madrid was established in 1971 – I, for one, belong to the second year of its graduates –, as an institution that combined in a confederation of schools what we may define, on the wake of the French model of the *Grandes Écoles*, the “great schools of architecture and engineering” then existing in Spain. These were “pioneering” institutions, all boasting a centuries-old tradition, that joined forces in order to create our current Polytechnic, which, in spite of its apparently recent experience (it is merely 50 years old), encapsulates the most important architectural and engineering tradition of the entire country.

We belong to a School that counted the greatest architects among its ranks – architects who built our historical heritage, nurtured by the avant-garde of each generation and by figures who physically shaped the contemporary habitat of cities in a considerable portion of our country.

Historically, all of our most important professionals taught in this School, and this is still true today, as belonging to our teaching staff is a source of remarkable pride.

We built our own city, Madrid, and, starting with our School, the university campus, designed by our director Modesto López Otero, 90 years ago, where most buildings were designed by our professors.

Our School is closely related to the professional realm and not just to the knowledge of architecture, and this aspect is indispensable for the education of future professionals.

The School is deeply related to the society it lives in. It intervenes in the decision processes of our community and city. It tries to make its voice heard in the seats of discussion, and to understand and analyse the role of architects in the present and future world.

We have come a long way from the age when the architectural profession was practically a univocal path and belonged to the category of liberal professions, and from the model of recent decades, when the architect was part of a large firm or of a company.

There has been a radical change over the last fifty years. The goal of the education we offer is exclusively granting a professional achievement in the world at large.

We are training professionals who may be able to address various types of tasks in every realm and at every scale, not only in the field of architecture as we used to view it in the past. These range from the design of furniture and daily objects to interior design, and the design of buildings, urban spaces and of the city itself, without forgetting planning and territorial organisation,

and even other realms where our expertise – resulting from the multi-disciplinary, creative and technical training we possess – allows us to tackle once unusual issues.

The city and the territory are part of our expertise. While all architecture-related skills are reserved to our profession, we also benefit from an exclusive shared with civil engineers for all aspects related to urban planning and territorial organisation.

In our School, education in such disciplines is managed by an important department, the Department of *Urbanismo y Ordenación del Territorio* [Urban Planning and Land Planning], which imparts lessons at the level of both Degree Programme and the *Master Habilitante* (Master's Degree), as well as at the level of various post-graduate and doctoral programmes. In this respect, I think it is appropriate to explain the structure of the School.

In the Spanish university, teaching is the responsibility of Departments, which can be inter-faculty or belong to one Faculty or one School only.

During the departmental reorganisations undertaken within our University, ETSAM always opted for the preservation of a structure made of its own Departments, where professors are specialists in the different fields of architecture education, and exclusively teach in our School.

During the more recent departmental reorganisation, which drastically reduced the number of Departments, only the Departments of *Matemática Aplicada* and *Lingüística Aplicada a la Ciencia y la Tecnología* [Mathematics and Linguistics Applied to Science and Technology] chose to become inter-faculty, although both preserve a specific departmental Section for our School.

Our structure includes the Department of *Ideación Gráfica Arquitectónica* [Architectural Graphic Design], devoted to all the tools required to provide a graphic form to the creation and design process.

Its activity mostly addresses the first programmes of the educational path, although there is a more in-depth programme in the fourth year and a contribution in the *Master Habilitante*.

The Department of *Matemática Aplicada* [Applied Mathematics] provides the tools and mental structure required to address the technical studies indispensable for our career.

The Department of *Composición Arquitectónica* [Architectural Composition] deals with the analysis, theory and history of architecture. It comprises a range of mandatory

subjects, such as *Introducción a la Arquitectura* [Introduction to Architecture], *Historia del Arte y de la Arquitectura* [History of Art and Architecture], *Análisis de la Arquitectura* [Analysis of Architecture], *Composición Arquitectónica* [Architectural Composition] and *Historia de la Arquitectura y del Urbanismo* [History of Architecture and Urbanism], as well as *Jardinería y Paisaje* [Gardening and Landscape]. The Department also contributes to the first-year experimental workshops with the *Análisis de la Imagen de la Ciudad* [Analysis of the Image of the City] programme, a subject I personally teach. I also teach the mandatory subject *Análisis de la Arquitectura* [Architecture Analysis], without forgetting the fourth-year in-depth workshop *Taller de Apoyo a la Investigación* [Research Support Workshop]. The Department's activity also includes one of the modules of our *Master Habilitante*, which underlies the definition of the *Proyecto Final de Carrera* [Final Career Project] in term of the aspects concerning design composition and the analysis of typologies.

Technological disciplines are the responsibility of two departments: the Department of *Construcción y Tecnología Arquitectónicas* [Construction and Architectural Technology] (with a range of mandatory and optional subjects related to construction technologies in all their facets) and the Department of *Estructuras y Física de Edificación* [Structures and Building Physics] (starting from the necessary development of thought through physics and up to calculation and structural design, which represents one of our professional responsibilities). The contribution these two Departments offer to the *Master Habilitante* programme is predictably of the utmost importance and materialises in specific modules that replace the definition of the *Proyecto Final de Carrera* at the level of executive design.

All the subjects related to urban planning policy and the study of the city are managed by the Department of *Urbanismo y Ordenación del Territorio* [Urban Planning and Land Planning], which provides educational contributions throughout the entire study programme up to the *Master Habilitante*.

The Department's activity focuses on planning and urban design, although the most fruitful research lines it develops also include sustainability studies and the implications of genre aspects in the urban planning discipline.

The design of the "architectural fact" at the various scales is the prerogative of the Department of *Proyectos Arquitectónicos* [Architectural Projects]. Its activity is articulated in a range of

mandatory subjects imparted during the Degree Programme starting with the second semester that articulate education across the various years, up to the achievement of the *Master Habilitante* represented by the *Trabajo Fin de Master* [Final Master's Project].

In our School, the Department of *Proyectos Arquitectónicos* boasts the highest number of chairs and attracts the bulk of resources. The most celebrated architects of our country have been members of this Department, and taught architectural design in our classrooms thanks to the knowledge acquired through their professional practice.

The education guaranteed by the long curricular path of ETSAM is complete in every realm of architecture. Some of these subjects, such as sustainability, are implicitly treated in the entire programme, while others, such as the management of built heritage, are specifically explored through a range of disciplines to be later developed through a University Master, such as the Master in *Conservación y Restauración del Patrimonio Arquitectónico* [Conservation and Restoration of the Architectural Heritage].

The education preparing to the qualification as Architect is structured into two successive paths. The first path lasts five years and corresponds to the Degree in *Fundamentos de la Arquitectura* [Fundamentals of Architecture], a title that, while the School is still studying the applicability of the regulation, may be equated with the MECES 3 level, as it grants 300 ECTS credits, with all the consequences resulting from being considered also as a Master, given the number of credits and the education provided.

The successive *Master Habilitante*, which lasts one year, allows the exercise of the profession, as in Spain there are neither professional associations, nor committees or other governmental bodies entitled to release such license. As a result, only Schools of Architecture have the authority to grant access to the architecture sector, an activity for which the law provides a specific exclusive. Consequently, our title of "Master en Arquitectura" qualifies for the exercise of the profession.

Only architects can practice in our field, although, as previously mentioned, in the urban planning sector we share such professional exclusive with civil engineers.

Architecture and Medicine are the two professions that, for the nature of their education and practice, benefit of a specific EU Directive in Spain.

Besides the *Master Habilitante*, the School offers a range of specific Masters, which can be of two kinds: university Masters,



“Imagining Futures”,  
 Norman Foster  
 Foundation,  
 Politecnico di  
 Milano, Universidad  
 Politécnica de Madrid,  
 Madrid, February  
 17-21, 2020. Photo  
 by Norman Foster  
 Foundation.

with a public fee and imparted by our professors, or specific titles, conferred by our University and subdivided into the categories of *Experto*, *Especialista* and *Master*, the fee of which varies upon the number of credits, and which are imparted, for a minimum of 30%, by our professors and for the rest by outer specialists.

*Arquitectura de Interiores* [Interior Architecture], offered as both a Degree Programme and as a Master, stands out among such titles for its now long tradition. An equally long tradition is boasted by the *Real Estate* Master, the most renowned in Spain, and by the *Advanced Studies UPM/ETH in Collective Housing* Master, offered by the Universidad Politécnica de Madrid (UPM) and by the Swiss Federal Institute of Technology (ETH).

The School is promoting Masters in a complete range of fields. We have recently made an agreement with Skidmore, Owings and Merrill (SOM) resulting from their involvement in our programmes in the field of structural engineering. In addition, we offer a range of inter-departmental Masters, such as the MACA (*Master Universitario en Comunicación Arquitectónica* [Master’s Degree in Architectural Communication]), which benefit from the contribution of other universities as well.

Let us not forget that ETSAM played a key role in bringing the Solar Decathlon initiative to Europe.

A further line of post-graduate programmes focuses on the respective technical specialties of the various Departments, with a remarkable variety of programmes including those of the Department of *Construcción y Tecnología Arquitectónicas* [Construction and Architectural Technology]. The Master of the Department of *Proyectos Arquitectónicos* [Architectural Projects] opens the doors of the world of research in this field and so does the corresponding Doctoral programme.

Architecture boasts the highest number of doctoral students among all the poles of the Universidad Politécnica, and a special section of the Doctoral School is exclusively devoted to it. The different programmes of the School, mostly related to specific Departments, are under the responsibility of this section, except for the *Patrimonio Arquitectónico* [Architectural Heritage] programme, which is inter-departmental, and the *Arquitectura y Urbanismo* [Architecture and Urbanism] programme, which is transversal.

Two more programmes opted for the humanistic studies section of our Doctoral School. *Comunicación Arquitectónica* [Architectural Communication], an inter-departmental programme, benefits from the contribution of professors from other universities, while *Arquitectura, Diseño, Moda y Sociedad* [Architecture, Design, Fashion and Society], is under the responsibility of three different poles of the Universidad Politécnica, although it is rooted in our Pole and benefits from the contribution of several European and American universities.

Three years ago, the deadline lapsed for presenting Degree Thesis according to the old system of the School. For the graduation ceremony, the School asked the Mayor for the authorisation to use the City Hall, a building erected in 1902 as the Communication Building by Antonio Palacios, the architect who shaped Madrid's image in the early decades of the twentieth century.

Several research groups in the School address the different realms related to architecture. The members of such groups author a remarkable number of publications recorded in the public catalogue of the University and in the main specialised databases; in addition, some of our researchers happen to be among the most accessed authors by foreign users.

Our School is a diverse environment, open to our community and our city, as well as to other Universities. Every year, almost 500 students travel thanks to various exchange programmes (ERASMUS, SENECA and Magalhães/SMILE), not to mention the specific agreements stipulated with Universities all over the



world, another instrument that promotes such mobility, a key tenet for the enrichment and diversification of our education. Indeed, such agreements also promote the mobility of our teachers.

This said, there is another positive phenomenon worth mentioning, which brought many of our professors to pursue their careers in other North American and European Universities, and even to reach top positions as Deans or Chairmen in such establishments, or to work there as Full, Assistant or Associate Professors. The School is very proud of their success, and maintains close relationships with such professors, because, whatever the University they work at, we are all architects and the models of city and architecture taught here are then exported by such teachers; at the same time, their experience provides us with new kinds of knowledge and teaching methods.

In our School, we are aware that we train diversified types of professionals. We stopped pursuing the univocal model of the “demiurge” architect who transforms the world with his work, although we know that students will variously participate in the creation of the current, both real and virtual, world that is emerging in the early decades of the millennium.

Therefore, we need to feel the pulse of the young generations, study the options they choose, the directions they take for their TFG *Trabajo Fin de Grado* [End of Degree Project], an educational phase guaranteed by all the Departments and through which students provide us with indications about these new ways of understanding the professional practice beyond the classical figure of the freelance professional.

However, the School also listens very carefully to the voice of society, of the community it belongs to and of Madrid, the city-workshop of our work. Indeed, we are required to understand how our education should evolve if we want to shape part of this future and meet the challenges of the society we live in. By the way, this is the mission of a superior-quality public University, a polytechnic University like our own.

For all of these reasons, our meeting today is so important; for this reason, it is essential to listen to our colleagues about their work and experience. The Politecnico di Milano and the Universidad Politécnica de Madrid are two major European public Universities; we are two Schools with a remarkable tradition that must cooperate, understand each other and jointly take responsibility for the teaching of architecture in a new world that is already here and in which both our Schools are fundamental points of reference.

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I listed a brief selection of books that made a special impact on my education and teaching practice. While all of them are certainly famous, some are relatively forgotten.

Christian Norberg-Schulz's *Intentions in Architecture* encouraged my generation to rethink a series of theoretical principles in architecture, how it could be understood and analysed, and the multiple aspects that converged in it. While I am referencing here the English-language edition I read at the time, the Spanish translation resulted from the efforts of two members of our firm: Jorge Sainz Avia, current director of the Department of *Composicion Arquitectonica* of the ETSAM, and Fernando Valderrama.

NORBERG-SCHULZ Christian, *Intentions in Architecture*, The MIT Press, Cambridge, Massachusetts, 1965.

Robert Venturi's *Complexity and Contradiction in Architecture* taught us a new way of reading architecture, of understanding elements with a two-fold meaning. We finally found a book in which classical architecture, modern architecture and the contemporary element created for us a wonderful mosaic.

VENTURI Robert, *Complejidad y contradiccion en la arquitectura*, Gustavo Gili, Barcelona, 1972.

*Précis des leçons d'architecture* was one of the most relevant books in the early twentieth century. Its simple way of teaching to compose architecture, devised for non-architects, fascinated our profession. The mastery of French in European cultivated generations was limited, in our country, to my generation and therefore, in the early 1980s, the moment had come to publish its translation, curated by Javier Girón, Alfonso Magaz and myself. Needless to say, we had to ask Rafael Moneo to write the introduction to this first Spanish edition, translated by us and published by Pronaos.

DURAND Jean Nicolas Louis, *Compendio de lecciones de arquitectura. Parte grafica de los cursos de arquitectura*, Pronaos, Madrid, 1981.

Manfredo Tafuri was the great historian and theoretician who influenced our generation at the time of our studies. His magnificent *Architettura Contemporanea*, written with the influential Francesco Dal Co, taught us that there is not only one but many histories of architecture.

TAFURI Manfredo, DAL CO Francesco, *Architettura Contemporanea*, Electa, Milan, 1976.

I could not help including in this selection one of the texts written by Rasmussen, the author of *Experiencing Architecture*, for which I personally wrote the prologue, as a homage to a long series of architectural theory books published by Jorge Sainz for our department at the Reverté publishing house.

RASMUSSEN Steen Eiler, *Ciudades y edificios: descritos con dibujo y parabas* (Documentos de Composición Arquitectónica 3), 2014.

## JUDGING OR UNDERSTANDING? THE SENSE OF HISTORY

Federico Bucci

I must immediately confess the source of the title of my essay: a paragraph from *Apologie pour l'histoire*, the book Marc Bloch – historian, university professor and a member of the French Resistance – was working at when he was arrested, tortured and shot by the Nazis on June 16, 1944.

The question asked by Bloch is always relevant: can the historian erase himself in front of the facts he reports? He certainly cannot, but he is not a judge who is responsible for passing sentence. Therefore, he has to turn his passions towards an action spurred by the desire to “understand”, a far from passive attitude.

I have chosen this opening to address the illustrious friends from the School of Madrid because it allows me to present a personal point of view, the result of concrete experiences, about the much-debated issue of the role of history in the education of architects. As a student and later a professor at the School of Architecture, now *Scuola di Architettura Urbanistica Ingegneria delle Costruzioni* [School of Architecture Urban Planning Construction Engineering] of the Politecnico di Milano, with a now 40 year-long experience, in the first part of my speech I would like to invite you to grasp the specific way of teaching historical subjects in the polytechnic educational path.

I am only briefly mentioning the beginnings, in the nineteenth century, when Camillo Boito (founder of the “Architecture” section of the Politecnico) wrote *L'architettura del Medio Evo in Italia* in order to propose a “style” to be adopted by Italian architecture, soon after the country’s unification.

Instead, I would like to focus on the period between the 1950s and the 1960s when Ernesto Nathan Rogers, a professor at the Politecnico di Milano and a member of the BBPR firm, became the leader of a “pedagogic revolution”, developed around a way of understanding the history of modern architecture in relation to design practice.

For Milanese architects in the twentieth century, those years represent a golden age in their respective creative and intellectual developments: the extraordinary masterpieces built in Milan and across Italy acquire an undisputed central role in the international debate.

The refined atmospheres of Franco Albini's museums and exhibition designs, the elegance of the houses designed by Ignazio Gardella, Luigi Caccia Dominioni, Asnago and Vender, the two opposite approaches to tall buildings proposed by BBPR with the Velasca Tower and by Gio Ponti with the Pirelli Tower, the vibrant social experiments proposed by Piero Bottoni with the QT8 district and by Vittoriano Viganò with the Istituto Marchiondi, the churches designed by Carlo De Carli, the results of the collaborations between the Olivetti industries and architects like Luigi Figini and Gino Pollini, Marco Zanuso and others, are studied, appreciated and known all over the world.

In addition, the magazine "Casabella-Continuità", helmed by Ernesto Nathan Rogers between 1953 and 1965, and printed by the Milanese publisher Gianni Mazzocchi, argued for a critical "continuity" with the so-called "Modern Movement", and in so doing played a precise role in guiding and promoting, through in-depth theoretical investigations, an architecture rooted in the culture and traditions of the Italian territory.

The secret of this success lies in the "discovery" of history as a key to interpret and overcome the teaching of the masters of modern European architecture and as a way of relating with the new reality of life.

For Rogers, the study of history provided a two-fold operational ground. On one side, the "pre-existing environmental conditions", or the characters of the context surrounding the new architectures, on the other side the roots of modernity that,



*MantovArchitettura.*  
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through the studies on Van de Velde and the nineteenth century in Lombardy, on Loos and the German expressionism, on the School of Amsterdam and Soviet architecture, radically question the established orthodoxy of the International Style.

In the inaugural lecture to the *Storia dell'architettura moderna* [History of modern architecture] course held at the Politecnico di Milano in the academic year 1964-65, Rogers stated that «history is constantly evolving; history is the life of men in their conscious intuition, or in their use of life, therefore in their habits. Architecture represents this use of life, these habits, in a specific and entirely extrinsic, therefore in an expressed, realised way. If there is an art in which one cannot lie or pretend, one cannot produce a fake in the conceptual sense, that is precisely architecture, where one can say that history expresses itself graphologically, according to its intimate entity and with no possibility of elusion».

However, Rogers views the study and interpretation of history as a political act as well, which amounts to justifying the necessary “catharsis” for the democratic season of Italian architecture.

In the post-war period, Albini, Gardella, BBPR, Bottoni, Figini e Pollini, Asnago and Vender, De Carli, Caccia Dominioni, Zanuso, as well as Muzio, Ponti, De Finetti and others, wanted to break free from the heavy heritage of Fascism, and the driving force of historical interpretation provided them with the common ground for the battle for the reconstruction of the country.

This ethical foundation underlies the most “heretical” works by Milanese architects – works that represent the manifestos of a new poetics resulting from the civil commitment of the intellectual-architect and his relation with social transformations.

European architectural culture, in the 1950s firmly anchored in the modernist dogmas, reacted unfavourably to the deviations proposed by Milanese architects, presented on “Casabella-

Continuità” and at the CIAM (International Congress of Modern Architecture) held at Otterlo in 1959.

The British critic Reyner Banham voiced his harsh invective from the authoritative tribune of “The Architectural Review” (April 1959). «The present baffling turn taken by Milanese and Torinese architecture probably appears the more baffling to ourselves, viewing from the wrong side of the Alps, because of the irrelevant hopes, the non-Italian aspirations of our own, that we have tended to project on Italian architecture since the war. Without realizing what we were doing, we built up a mythical architecture that we would like to see in our own countries, an architecture of social responsibility – stemming, we believed, from such political martyrs as Persico, Banfi, the younger Labò – and of formal architectural purity – stemming from Lingeri, Figini, Terragni. This architecture, socially and aesthetically acceptable to men of goodwill, we saw embodied in particular in the Milanese BBPR partnership, of which the first B was the martyred Banfi, the terminal R was Ernesto Rogers, the hero-figure of European architecture in the later Forties and early Fifties».

This opening of *Neoliberty. The Italian Retreat from Modern Architecture* was a whipping for Italian architectural culture that, along with the replies from Rogers himself, Zevi and Portoghesi, testifies to a heated discussion about the relationships between design and history in European architecture.

However, not everyone shared the criticisms to the change proposed by the most advanced representatives of Italian architectural culture.

In 1961, “Casabella-Continuità” published a special issue devoted to the *Quindici anni di architettura italiana*. Two years after the polemics with Banham, the magazine helmed by Rogers pursues a more meditated assessment of the best expressions of national architecture, of the new trends, the “deviations from the modern method”, the relationship between architecture and urban planning, the role between criticism and technical problems. The issue mostly comprises a survey with six questions revolving

around these themes proposed to Italian and foreign architects.

These include Douglas Haskell, the editor of *The Architectural Forum*, who, with an excellent knowledge of the Italian scene, replied by underlining the quality of some “heretical” works produced by Italian architecture, almost exclusively by Milanese architects.

Indeed, for Haskell, Figini and Pollini’s Church of Our Lady of the Poor, Mangiarotti and Morassutti’s church in Baranzate, Moretti’s House of the Sunflower in Rome, the Pirelli and the Velasca Towers, Ignazio Gardella’s designs, down to Viganò’s Istituto Marchiondi are bold manifestations of new expressive forms, issued from the context or from personal languages, that can give a jolt to the dormant “main trend” of modern architecture.

However, in spite of the praises, Rogers’ assessment of the conditions of Italian architecture was quite negative.

«We must admit – the editor of “Casabella-Continuità” wrote – that, even in our country, in spite of its willingness to communicate, architecture has been unable to overcome the boundaries of the *élites* and to penetrate society. Lively experiences are small islands in a sea of profiteers and embalmers: the economic boom that resulted in a multiplication of building sites has failed to generate a widespread architectural civilisation». In concluding his meditations, he stated, «The next step – although it seems a paradox – is exploring history to the point of forgetting it. If we burn tradition completely, we will leave no residues and all the energy will go into the new flame».

However, the illusions of history vanish all too soon. Starting with the 1960s, the ideology of the “new urban and territorial dimension” put an end to the researches about the relationship between tradition and modernity and opened a new season for Italian and European architecture. At the same time, in another field, industrial product design offered new and wider trajectories for work.

In the academic year 1963-64, Rogers invited a young Roman architect, Manfredo Tafuri, to hold some lectures within his *Storia dell’arte e dell’architettura* [History of art and architecture] programme at the Faculty of Architecture of the Politecnico di Milano. A few years later, Tafuri, born in 1935, would be appointed as professor at the Istituto Universitario di Architettura di Venezia and would become the protagonist of a season when the “sense of history” opened new perspectives for architectural education and research.



This is our past – we have studied it and are well aware of its importance and weight.

However, in order to deserve the title it carries, a School must be able to activate the critical thought of the different generational circuits that compose it.

In other words, it must promote an action of interpretation – rather than mere application – of the lesson a generation offers to the one following it. A School only made of followers is unable to grasp the future horizon and is fated to fail. “Those who come afterwards” need to overcome the “unhappy conscience” of the disciple and take responsibility in order to become new masters.

As advised by Jacques Derrida in a magnificent paper devoted to his master Michel Foucault, the disciple must «break the glass, or better the mirror, the reflection, his infinite speculation on the master. And start to speak»<sup>1</sup>.

Therefore, in my experience as a history professor at the School of Architecture of the Politecnico di Milano, now *Scuola*

*MantovArchitettura.*  
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House of Mantegna,  
Mantua.

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1. DERRIDA Jacques, *Cogito et historie de la folie*, in “Revue de métaphysique et de morale”, vol. 68, 1963, pp. 460-494.



*di Architettura Urbanistica Ingegneria delle Costruzioni* [School of Architecture Urban Planning Construction Engineering], driven by the need to rebuild those “forms of time” that can project a scenario of references for the architect, I try to commit to three directions within the *Architectural design and history* Degree Programme at the Pole of Mantua.

The first commitment is focusing on the architectural work by avoiding any ideological narration and pointing instead to the aspects concerning the relationships among client, architect and relative historical, economic-social contexts, as well as to different design phases and construction practices. In other words, understanding the building, from conception to construction, is the main goal I pursue in the lessons I impart to my students.

The second issue concerns the selection of the works I will focus on within the programme that, from the chronological point of view, spans from the eighteenth century to the present. Nowadays, architects view the ethical and aesthetical boundaries established by the so-called “Modern Movement”, as well as the very notion of Modern, as something definitely belonging to the past. Instead, all but a few history manuals of “modern architecture” still propose a chronological reconstruction and a selection of examples that is not different from the one presented by Bruno Zevi in his seminal text from 1950. In addition, the contemporary age is all too often confined to a marginal space, and the result is that our students are deprived of orientations in the daily relationship with the present and easily fall prey of the uncontrolled information that circulates on the web.

As I try to convey also through my work in the editorial committee of the magazine “Casabella” and my contribution to the programme of *MantovArchitettura* (the series of events we introduced in the educational programmes at the Pole of Mantua), we have to make an effort to update the selection of works and architects in the education offered to architecture students.

Finally, I think the experience developed in design workshops is very important, as the historian not only has a primary role in contributing to the design work itself, but also measures the values of historical knowledge in a close relationship with the architectural disciplines.

Having said as much about the contents, and focusing now on the forms of historical narration, given that our activity almost entirely occurs in university classrooms, we should not avoid the use of technologies that allow for a restitution of the reality of

buildings. In this realm, along with the METID Centre (*Metodi e Tecnologie Innovative per la Didattica* [Innovative Methods and Technologies for Teaching]) of our University, I developed a Mooc (*Massive Open Online Course*) with the title *Introduction to contemporary architecture*: an experience whose results exceeded our expectations.

I go back to the question asked at the beginning: understanding what?

That architecture is the space where “human time” takes place, a time that keeps resisting «to implacable uniformity or fixed divisions of clock time»<sup>2</sup>.

And, in order to measure the flow of human time, the plasticity of history is necessary, as in its constant effort at understanding, it exercises the art of doubt, the only path to knowledge.

In conclusion, allow me to quote the verse from Giacomo Leopardi’s *Canto notturno di un pastore errante dell’Asia* [Night Song of a Wandering Shepherd in Asia], translated by Friedrich Nietzsche in an entirely personal way in order to show “the damage of history on life”:

«Dimmi: perché giacendo  
A bell’agio, ozioso,  
S’appaga ogni animale;  
Me, s’io giaccio in riposo, il tedio assale?»<sup>3</sup>

This is the reality of the poet’s thought, against the interpretation of the philosopher: without history, one dies of boredom.

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2. BLOCH Marc, *Apologie pour l’histoire ou Metier d’historien*, Librairie Armand Colin, Paris, 1949; eng. ed. *The Historian’s Craft*, Penguin Random House, New York, 1963, p. 189.

3. «Tell me, dear flock, the reason why Each weary beast can rest at ease, While all things round him seem to please; And yet, if I lie down to rest, I am by anxious thoughts oppressed?».

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## TEACH WHAT YOU KNOW

Ignacio Vicens y Hualde

**T**here are many ways of teaching architecture – for this reason, Schools may rely on a variety of different methods.

Having no relationship with design was one famous condition imposed by Rem Koolhaas when he conducted a workshop at Harvard. As research was his sole interest, he only intended to share that activity with his students. Given such controversial condition, he consulted his students and the result was that the workshop was not completed. «Unfortunately, they don't want to research on design; they want to design».

The way we teach at the School of Madrid is nothing like this. We believe that the project may integrate both design and research.

One may say that we go by the old *dictum* according to which “you learn to design by designing”, and, at the same time, by reasoning about it.

With one exception only, all the design professors at the School of Madrid are also architects who combine education and professional practice.

I believe that the coexistence of teaching and professional practice helps the teachers who want to encourage their students to go down roads they previously discovered and experienced first-hand. In other words, you teach what you know.

A design professor who at the same time works as an architect can hardly keep the challenge of making architecture a reality separated from the meditation around it and from its teaching.

Obviously, there is the option of so-called “in vitro” experimentation. However, “pure” theory, solipsistically dissociated from the real world, entails some major inconveniences. One is the danger of so-called “academicism”: “decontaminated” theory, blind to any object beyond a close “elite” realm of interest, reflects a very attractive reality. Pity that it does not exist! It is not real!

As the best of Western thought always managed to materialise its principles on the battlefield of social, economic, political, cultural problems, so the best of architectural thought has resulted from a painstakingly admirable effort of verifying its soundness in a defined world within a precise culture.

Relying on the example of experience is the only way to avert the danger of autism.

Such open and integrating attitude tries to bring the world of professional reality and the world of experimentation together so as to take advantage of both.

It is useful to remember that we are threatened by two equally serious dangers: on one side, the contempt certain academic circles harbour towards professional practice exclusively viewed as an activity unburdened by cultural concerns; on the other side, the disdain and condescence certain professionals harbour toward the university environment, seen as self-referential and removed from social needs and reality.

Both attitudes are questionable, as they tend to over-simplify.

While always accepting the radical difference between simulation and reality, design may be a meeting ground between the specialisation of instrumental techniques and the generalisation of theoretical approaches.

When one opts for the right method, design can and must be at the same time research, in a way that denies the antithesis proposed by Rem Koolhaas at Harvard.

Thus intended, the teaching of design occurs in an environment where practical knowledge and theoretical research coexist.

Creative activity always develops within a conceptual frame and is accompanied by a sequence of practical notions that develop analytical as well as synthetic skills; *poiesis* and *techné*, conception and execution share the same ground by blurring the boundaries between research and construction, between generic abstraction and

practical achievement and, more importantly, between architectural design and its cultural environment. A pedagogy based on the transmission of experiences in no way implies disdain for theoretical speculation.

Rather, it stands for an approach that can combine intellectual meditation and practical reality: a position that equally abhors disillusioned pragmatisms and the solipsisms that only like themselves, and are entirely alien to any operational reality. Therefore, “teaching to design” is not merely an exercise for the transmission of experience, and rather is an opportunity to discuss a theory integrated with knowledge, directly connected to practice that facilitates the references to the student and promotes one’s own design experience.

Teaching is understood as a process that reveals a complex reality in which the teacher, through a personal objective experience, becomes a catalyser for a double response to the student in terms of thinking and making architecture: it facilitates the student’s “reflection” about certain design issues as a means to improve his ability to “decide”.

For this reason, I think that one of the positive aspects of the School of Madrid is its commitment to recruit, within the group of design professors, all the architects who stand out in their professional practice and, at the same time, show interest in and ability to practice teaching.

Another positive aspect is the will to structure teaching around design, understood as an exceptional opportunity to combine theoretical meditation, critical thinking and actual proposals, by observing and drawing inspiration from reality.

Finally, I would like to point out another key feature of the School of Madrid: certain Schools have no genealogy, as their prestige relies on working methods or systems; other Schools rely on the figure and prestige of a professor who is inextricably tied to them. Mies at the IIT, Botta in Mendrisio, Hejduk or Eisenman at the Cooper Union are just a few examples.

Finally, there are choral Schools, relying on the influence of a group of professors. Our School belongs to this category. One cannot understand ETSAM without retracing the trail of Oiza, Carvajal, Sota, Moneo, Fisac, Cano Lasso, Fernandez Alba, and the list could go on.

I believe such collective heritage is currently one of the qualities the School of Madrid can offer its students. The different methodological, ideological and even organisational approaches

clearly represent a benefit for the student, as they avert the danger of uniform, dogmatic or reductionist views. Protecting such heritage is essential if we want to preserve the open and inclusive spirit that makes our School stand out among other universities.

Perhaps, the greatest advantage of a public and mass university like our own lies precisely in its open configuration, which allows for the development of an extraordinarily diversified range of offers – this is its richness. Insisting on the ideological, organisation, administrative or any other kind of uniformity would mean opting for examples close to the private models, which are nothing like our School.

# DESIGNING CONSTRUCTION

Maria Pilar Vettori

On October 22, 2014, Renzo Piano held the *Lectio Magistralis* during the inauguration of the 152th academic year of the Politecnico di Milano. One of the main principles worthy of meditation in his *Lectio* is that «architecture is an art trade, although it is an art at the frontier with other arts»<sup>1</sup>.

In a vision of the concept of “frontier” that, as illustrated by the sociologist Richard Sennett, differentiates between its meaning as “limit” (boundary) and as “area of interaction” (border)<sup>2</sup>, what could seem like a vision of marginalisation of our discipline, may, instead, be read as a centrality when observed from an opposite perspective. The centrality of a discipline whose undefined and changing borders blur with those of all the other disciplines, as its implementation requires it to interact with them. Such centrality, or we might even say “universality”, to quote Alberto

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1. PIANO Renzo, “Renzo Piano: fare architettura”, *Lectio* at the Inauguration of the 152th academic year of the Politecnico di Milano, October 22, 2014. Renzo Piano’s full lecture is available at:

<https://www.youtube.com/watch?v=tb5bQ6QmeSM>.

2. The difference between borders and boundaries has been explored by the American sociologist Richard Sennett in several occasions, both through papers (SENNETT Richard, *Boundaries and Borders*, in BURDETT Ricky, SUDJIC Deyan (ed.), *Living in the Endless City*, London, 2011, pp. 324-331) and through speeches and lectures (including the lecture “The Edge: Borders and Boundaries”, Cambridge Law Faculty, March 10, 2015). Some of his papers concerning the issue of the construction of the city also mention the difference between these two meanings of the word “edge”. «One spatial distinction which helps us engage actively with the changing context of time lies in the difference between borders and boundaries. This is an important distinction in the natural world. In natural ecologies, borders are the zones in a habitat where organisms become more inter-active, due to the meeting of different species or physical conditions. The boundary is a limit; a territory beyond a particular species does stray. So these are two different kinds of edge», in SENNETT Richard, “The Public Realm” in BRIDGE Gary, WATSON Sophie (ed.), *The Blackwell city reader*, Blackwell Publishing, 2010. «Steven Gould draws our attention to an important distinction in natural ecologies between two kinds of edges: boundaries and borders. The boundary is an edge where things end; the border is an edge where difference groups interact» in SENNETT Richard, *The Open City*, later reprinted in SENNETT Richard, *Building and dwelling. Ethics for the City*, Allen Lane, London, 2018 (It. ed. *Costruire e abitare. Etica per la città*, Feltrinelli, Milan, 2018).

Campo Baeza<sup>3</sup>, is precisely the essence of teaching to design.

Such centrality of architecture in human life, in society, in its development, in its cultural growth, is the result of one essential factor: construction. Because architecture, as once more argued by Renzo Piano, «is primarily the art of making buildings» and «[...] being an art, it has an amazing, a magical element, although always in real life, not only in the spirit. Construction is the reason why architecture is amazing and excites us»<sup>4</sup>.

In a meditation about education in architecture, it is very important to point out its being a “built phenomenon” within its being an essential component of the aesthetical experience of the city and of its spaces. An anecdote, perhaps not documented historically, unequivocally illuminates this aspect. Around 1800, the writer Stendhal was in Rome, and, to answer the question an American tourist had asked him about the monumentality of Saint Peter’s dome: «What purpose does it serve?», he answered, «Its purpose is making our hearts beat faster when we see it from afar!». Philippe Petit, the French high-wire artist, who became famous for walking on a high wire between the Twin Towers in New York in 1974, reports this episode in his book *Creativity. The Perfect Crime*<sup>5</sup>. Knowing the story of Petit’s most famous feat, described in his book *The walk*<sup>6</sup>, one can easily understand the reasons for a definition of the creative act as a “criminal”, outlaw gesture. However, the most significant aspect of this story lies in the fact that he took 45 minutes to perform his

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3. The reference is to the title of Alberto Campo Baeza’s speech, *Rinuncia e Universalità*, held during the 2018 edition of the *Milano Arch Week* on May 23, 2018 at the AUIC School of the Politecnico di Milano.

4. PIANO Renzo, op. cit.

5. PETIT Philippe, *Creativity. The Perfect Crime*, Riverhead Books, New York, 2014.

6. PETIT Philippe, *To Reach the Clouds. My high wire walk between the Twin Towers*, North Point Press, 2002.



foolish or magical – that depends on the result – idea of walking a high wire for 60 metres between the World Trade Center’s towers at 412 metres above the ground, on August 7, 1974, but his feat required a preparation of eleven months, and years since he first thought about it. Therefore, the implementation of the idea implies an intense technical and scientific work carried out with the help of a multi-disciplinary team, in order to achieve an action that the entire world remembers only for its challenge and magic because, as Petit stated, «the wirewalker intent on safety deprives the onlookers of aerial poetry».

Creativity and balance, even in architecture, are necessary conditions for an artistic as much as technical process, the aspiration of which is conveying the values of a collectivity in order to make them endure and therefore become the expression of the “beautiful” rather than merely of the “new”. Architecture represents the built expression of changes, as making buildings is not merely a response to needs and requirements, and rather incorporates the physical translation of desires and aspirations. Contemporary issues such as the fragmentation to skills, the specialisation of forms of knowledge, the fast modification of working tools, the new methods and models of design organisation, the digitalisation of structures and networks, and the

Le Corbusier at the building site of the *Unité d’Habitation* (1945- 52) in Marseille, 1945-52.

Mies van der Rohe at the building site of the *Alumni Memorial Hall* of the Illinois Institute of Technology (1945-1946) in Chicago.



hyper-development of communication are phenomena that affect the immaterial – economic, social and cultural – structures of a community as well as the material structures of the space where the physical and spatial transformation of the environment occurs. The challenge of complexity results from social, technological and environmental changes – it involves “space” as a material resource, in its global as well as human scale; and “time” as an immaterial resource, now assessed in terms of speed and flexibility, as well as of duration and permanence. The protagonist of this situation is the relationship between man and the environment, therefore architecture as the construction of inhabitable places (spaces) and ways of inhabiting (times) that may guarantee an increasingly high level of quality.

Starting with the modern age, the parameters of measurement and quantification of the concept of quality have multiplied and branched out, in an increasingly scientific and sophisticated form, and as such have provided key operational instruments to design. Nowadays, numbers seem to provide the only reliable answer to energy, environmental, comfort, efficiency, economic feasibility issues.

However, a part of knowledge escapes the measurement processes, as “reason”, a primary element in the creative action, in the triad that Diderot places at the beginning of the Preliminary Discourse to the *Encyclopédie*, stands between “memory” and “imagination”<sup>7</sup>.

Consequently, such elements affect design understood in its unity, as a synthesis of multiple forms of knowledge that, given their constant evolution, undergoes a constant reassessment.

The studies made on the DNA over the last decades<sup>8</sup> have shown that it contains much more information than is needed to address change, and therefore demonstrate that the ability to address requirements coincides with the ability an organism has to select the adequate information from its accumulated knowledge.

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7. The first volume of Diderot and D’Alambert’s work appeared in 1751 under the title *Encyclopedie, or a Systematic Dictionary of the Sciences, Arts, and Crafts, by a Company of Persons of Letters coordinated by Mr. Diderot and, for the mathematics section, by Mr. D’Alembert*. Its Preliminary Discourse detailed the three branches of the contents as a reflection of thinking’s operational modes: « History, which is related to Memory; Philosophy, or Science, which is the fruit of Reason; and the Fine Arts, which are born of imagination».

8. The reference is to the studies of Werner Arber, the Swiss microbiologist who shared the 1978 Nobel Prize with the American researchers Hamilton O. Smith and Daniel Nathans.

The power of design is the power of synthesis. Therefore, it necessarily relies on a systemic, collective operational mode.

For the same reason, the act of building is the clearest and most tangible expression of the concept of choral cooperation. It serves not one individual but a community of individuals and, at the same time, its achievement implies the joint intervention of a number of individuals. Likewise, in the educational context, the paradigm of construction is the *incipit* of any action related to teaching and learning knowledge. As a result, the education of the architect must draw inspiration from his social as well as technical role, as he represents a professional group that affects public goods and objects, built with limited resources.

Reasoning on the foundations of the educational paths and tools, in light of the innovations that affect design production in conceptual as well as in instrumental terms, means reasoning on the ability of a School of Architecture to convey “design culture” as an ability to operate through actions that synthesise different disciplinary contributions by addressing complex issues through an aware creative process. The tools required to pursue such approach result from an ability to foreshadow, as implied in the very etymology of design, the new, and at the same time, in the ability to interpret continuity understood as a method coherence towards the «effective world of built architecture»<sup>9</sup>.

When Mies van der Rohe started his educational mission overseas, at the IIT of Chicago, his educational model mandated that students should be introduced to architecture through practices primarily aimed at composing simple buildings with elementary structures, understanding the properties of materials and the foundations of construction rules (the means), in order to pursue eventually more articulated buildings in order to understand functional issues (function), and finally the complexity of urban design (strategy as creative act). «Step by step: what is

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9. «Only the School of architecture, by teaching the elements of the architectural phenomenon in their essential reality, which is identification between principles and modes, may represent the demiurge as the catalyst between the world of ideas and the effective world of built architecture. Only in this way, will it be possible to help the young generations to acquire the conscience of the modern architect, aware of the techniques and capable of translating them into a figurativity that is not merely aesthetic but deeply representative of an integral society. [...] I said that only the School can fulfill the task of the demiurge because I do not believe that the architect as an individual may believe, as many have done, he is the demiurge himself: teaching to the young generations requires a common work and getting them used to a modesty that does not mortify them and to the effective exercise of the profession». ROGERS ERNESTO Nathan, *Gli elementi del fenomeno architettonico*, DE SETA Cesare (ed.), Guida Editori, Naples, 1981, pp. 56-57.



possible in construction, what is necessary for use and what is significant as art», the *IIT Curriculum* stated in 1941 by reaffirming the concepts of *Material*, *Function* and *Creative Work* previously expressed in the famous inaugural address of 1938, when he also stated that «true education is concerned not only with practical goals but also with values»<sup>10</sup>.

Today, working with the city, built heritage, landscape, and the environment requires a multiple vision: an ability to read problems as well as a mental readiness to grasp the opportunities. It is impossible not to notice the difficulties resulting from procedural complexity and the risks of a decreasing quality in buildings in turn related to an increasing focus on method aspects at the expense of results, to a concept of efficiency based on numeric parameters and to a linguistic banalisation dictated by procedural complexity.

If, on one side, education cannot afford not to convey tools and skills designed to address such operational conditions, on the other side, it can stimulate a critical approach aimed at the

Ernesto Nathan Rogers, Enrico Peressutti, Lodovico Belgiojoso at the BBPR firm in Milan.

10. MIES VAN DER ROHE Ludwig, *Armour Institute Inaugural Address*, November 20, 1938, in "Casabella", 767, 2008, p. 104.



Franco Albini with  
Walter Gropius at  
the Conference  
*L'architettura moderna  
ed i musei* at the  
National Gallery of  
Modern Art of Rome,  
November 21, 1961.

innovation of roles, methods and tools as the result of a reassessment of established models and procedures.

Nowadays, a polytechnic approach is more relevant than ever in the face of a professional and productive scene that primarily requires an openness to networking based on flexible tools and on an ability to manage change, in a vision of the School as an opportunity, as Franco Albini stated, for «experimentation and assessment in relation to construction techniques, survey tools, forms of knowledge in the various fields and in relation to a changing contemporary culture»<sup>11</sup>.

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11. ALBINI Franco, *Appunti per il seminario introduttivo*, 1964, in "Problemi didattici di un corso

Nowadays, a concept of “school” relies on the acknowledgment of the educational value of the built work, as architecture is «experiential and non mediatic», as argued by Kenneth Frampton in a recent essay about *Architettura Progetto e Università*<sup>12</sup>.

Therefore, teaching architecture cannot avoid a two-fold interaction – with international scenarios and the professional realm, in order to develop a figure of designer architect who is able to recognise the modification of the design status in the international context, all while protecting and enhancing our history, in synch with the universality of a discipline and the lesson of its masters.

The primary benchmark for the redefinition of professions is the international horizon. Stimulating a dialogue among different cultural positions about architectural education and creating the conditions for an adherence to contemporaneity without giving up on a principle of continuity. In this perspective, the different cultural and intellectual positions that, over time, have nurtured polytechnic culture represent a recognisably valuable heritage.

The premises for a meditation on the teaching of architecture as a constructional act must necessarily consider the semantic evolution of the issue as highlighted in two historical phases of the discussion about design education in Italy. While in 1971 *Si può insegnare a progettare?*<sup>13</sup> voiced a doubt about the possibility of conveying design theory and practice («You do not teach architecture, you can only learn it», Ludovico Quaroni used to say) and in 1986 any doubt about the possibility to teach disappeared with *Come si insegna a progettare?*<sup>14</sup>, replaced by a focus on the method and organisation of such transmission (with the introduction of Rogers’ workshop and educational culture, based on a formal separation between teaching of architecture and construction-related issues), *Teaching Architecture*<sup>15</sup> expressed a requirement and shifted the focus from the “design” action to “architecture” as an object/subject.

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di progettazione”, Istituto di Composizione della Facoltà di Architettura del Politecnico di Milano, Milan, 1968.

12. BORSA Davide, CARBONI MAESTRI Gregorio, *Architettura, progetto, università. Intervista a Kenneth Frampton*, in BELLONI Francesca, COLONNA DI PALIANO Edoardo (eds.), *Le scuole di architettura nel teatro del mondo*, “Architettura civile”, 20/21/22, Araba Fenice, 2018.

13. SAMONÀ Alberto (ed.), *Si può insegnare a progettare?*, proceedings of the first Seminar of Gibilmanna (August 28 – September 1, 1971), Il Mulino, Bologna, 1973.

14. BAFFA Matilde, BAZZI Agata (eds.), *Questioni di didattica del progetto*, proceedings of the seminar *Come si insegna a progettare?* (Politecnico di Milano, November 20-21, 1986), Libreria Clup, Milan, 1988.

15. The reference is to the title of the conference that inspired this publication.

Today, given certain essential postulates such as sustainability and connectivity, technology seems to overwhelm the design process by subjecting it to a sort of engineering and component production-related control. Therefore, teaching architecture as an affirmation of a “humanistic and human” dimension of being and working as an architect becomes even more necessary. Such necessity reopens the issue of “architecture – art or discipline?” in order to propose a terminological coexistence as it is the quality of design and of built elements that defines its belonging.

The relevance of a humanistic approach is closely related to the reintroduction of the concept of “beauty” in its modern meaning that passes from a subjective to a universal value. Hence the importance of the dialogue with a School, the School of Madrid that, besides the common polytechnic matrix, traditionally expresses a marked focus on the relationship between theory and practice, on architectural design as an intellectual and at the same time technical action. Promoting the figure of a humanist, generalist – while not generic – architect who can master the art of synthesis comes naturally and is now more necessary than ever. The result is a man of culture where culture means technical knowledge. «The school, unlike what is generally presumed, does not constitute the phase of true learning; rather it remains the only, ultimate, true opportunity, socially conveyed and contextual, of the foundation of one’s own identity through lofty thinking in architecture. If one is immersed in the profession without having first gotten to know architecture in its true disinterested, scientific and poetic basis, the flight towards the outside and the future starts from a very low point, and the young person runs the risk of being rapidly devoured by the banality of the context»<sup>16</sup>.

Design practice becomes the opportunity for theoretical development that, combined with the concept of continuity and balance, straddles the technical and poetical realms. Meditating on design education aimed at and promoting construction, rather than indissoluble certainties, stimulates questions and arises doubts to which both professors and students must and will have to try to provide an answer constantly.

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16. VIGANÒ Vittoriano, *L'architettura dell'esperienza*, in FAROLDI Emilio, VETTORI Maria Pilar, *Dialoghi di architettura* (1995), LetteraVentidue, Syracuse 2019 (third edition), pp. 157-170; eng. ed. *Architecture of experience*, in FAROLDI Emilio, VETTORI Maria Pilar, *Dialogues on Architecture*, LetteraVentidue, Syracuse, 2019.



Aldo Rossi during a survey for the unrealised design for the Milano Malpensa Airport, 1992 c. Courtesy Fondazione Aldo Rossi.

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# BUILDING WITH THE REASON AND WITH THE SENSES

Jesús M<sup>a</sup> Aparicio Guisado

I chose the title *Building with the reason and with the senses* for my paper as a cue to address some ways to approach knowledge of the architectural discipline.

This is in no way a hint to a univocal method that we firmly believe would be ineffectual in this realm of knowledge. On the contrary, we think it would be useful to consider the so-called “counter-method” that brings professor and student to meditate on architectural design and on Architecture as a built reality.

The goal of teaching is leading the student to the point where he can learn by himself. The construction of this place of knowledge results from the reason and from the senses. This training and educational project relies on the scientific and humanistic foundations architecture must possess.

The difficulty of an educational project in the academic context of architecture lies precisely in the two-fold condition of physical reality and mental reality that is inherent to architecture itself. We teach and judge through arguments that hark back to the past and through still unrealised ideas that we imagine as realised through the interpretation of some documents.

Such pedagogic difficulty is similar to the one the architect faces when he has to illustrate his design to the people who will actually build it.

Thus, the activity of learning represents a path that starts with the phase of training of the student-disciple, who should not be abandoned during the rest of his architectural process.

## Principles of teaching

The subjects of this “teaching programme” are the professor and the student.

Being more experienced, the professor tends to be the first to take advantage from teaching as, as we have seen previously, we consider that architectural teaching

relies more on the ability to learn than on education.

The teaching one wants to impart relies on two fundamental principles: freedom and reasoning. Freedom, so that the disciple may trace his own learning path and decide which ideas he intends to design and how he wants to build them.

Such trace of freedom is essential for the development of a method-less teaching.

The result would be, in such way, a kind of “academicism” that appears objectively old-fashioned. Usually, such ability to be free will remain, in the phase of development of designs, framed in the reality of some data of the place, of the function and even of a prerequisite. As teachers, we intend to face our students as the best of their clients: a client who knows where he wants to build, what he needs and the funds he disposes of in order to cover all the expenses.

Reasoning represents the other essential principle the teaching method relies on.

The ability to reason represents the antidote to whim. It represents the communication route between master and disciple. The issues will be discussed on the plane of logic. The arguments of criticism will always be discussed through logic reasoning, and the answers will be equally formulated with the same criteria. The “freedom-reasoning” combination produces some conflicting pedagogic results, not only in my over thirty years of personal experience as a teacher, but also in the teaching of this and other disciplines across the centuries.

## **Knowledge**

There are two ways of achieving knowledge: knowledge pursued through intelligence and knowledge achieved through the senses or recognition.

*Knowledge through the senses.* The most primitive knowledge achieved by the human being occurs through the senses. Knowledge resulting from the senses is what

we call perception. Since childhood, the human being develops an ability to perceive. First, he learns touch and hearing, later he acquires visual perception and learns how to recognise flavours through smell and taste.

Sensibility is the ability to feel. Educating the pupil to sensibility is a fundamental task for the knowledge of architecture. Such education is more effective in the early phases of learning (during the first design courses). It is primarily a question of underlining what the student already perceives in a more or less unconscious way. For example, if man is used to recognise himself through his face, he should be taught to observe. In the future, we will teach him how to see his hands. And so on.

The education to touch has the goal of teaching the student the value of haptic perception, of the consistence of materials, of their luminosity understood as the relationship between light and matter.

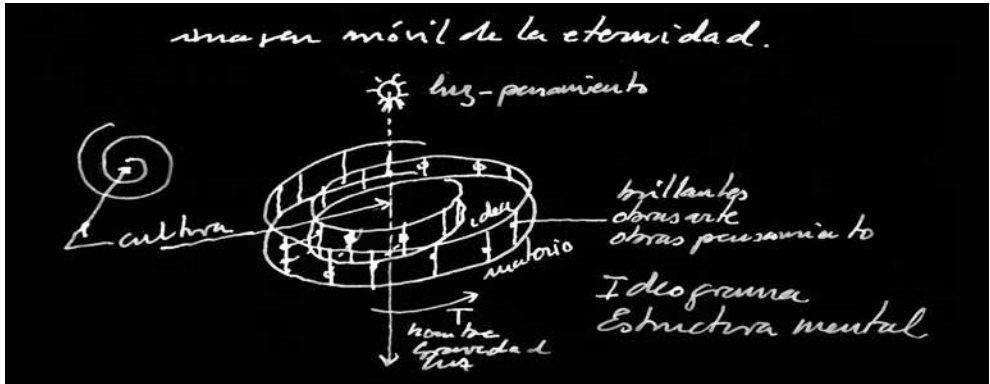
In the section of touch, one should address both the materials featuring a surface that is a constantly emerging interiority and the materials whose surface is a finish that may be glued, polished, painted.

Unsurprisingly, the education of touch is more developed in blind people. A study made by Doctor Marius von Senden about congenitally blind people in 1920 argued that such subjects do not have a concept of space. Thanks to Robin Evans<sup>1</sup>, we know, instead, that blind people do have a deep concept of space. The perception of space in a blind person is based mostly on touch and hearing, which provides a clue about the main knowledge we acquire through the sense of touch: the horizontal plane.

Knowledge through hearing is underdeveloped in human beings who can see. However, what you learn through your hearing is an important part of what you know through your other senses. Sound evokes distance, both through the echo, when we are alone, and through the intensity of the sounds we perceive. Indeed, intensity is indicative of the distance that separates us from the source of sound. Some examples may help to understand such phenomenon. On one side, the existence of ultrasound as a perceptive technique that reconstructs shapes through sound; on the other side, cinema and its way of making a scene recognisable as occurring either indoor or outdoor due to the presence, or

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1. EVANS Robin, *Mies van der Rohe's paradoxical symmetries*, in "AA Files", 19, Spring 1990, pp. 56-68.



absence, of environmental sounds. Sight, with its immediacy, all but overwhelms the auditory perception of reality. Both an excess of luminosity and a high level of noise result in a paralysis of the sense of hearing, which seems to be relegated to the world of darkness, of half-light, of shadows and silence. Unsurprisingly, creaking floors, dripping pipes, human steps, the sounds of rain and howling wind seem to be hearable only at night.

Visual perception is the most immediate form because it represents evident perception.

Through sight, we become aware of shapes, composition and colour.

We also recognise the horizontal plane we previously perceived through touch.

However, we should reason about the difference between seeing “something” and observing “something” specifically.

While sight is the perception of forms, the eye focuses on what surrounds the individual by encouraging his intellectual understanding of forms through the eye. The eye will allow us to distinguish between optical and planimetric. Robin Evans explains such difference in his description of the perception and view of Mies van der Rohe’s Pavilion<sup>2</sup>.

The knowledge acquired through the sense of smell should not be relegated to a merely literary realm or be the prerogative on wine tasters only. The descriptions the latter make of wines’ aromas open the doors to knowledge through smell and taste even before one actually drinks the wine. Within the educational realm, we should convey the sensibility to aromas, the ability to distinguish the aromas of seasons, materials, vegetables, by

Ideogram of Knowledge and Will. Explanatory drawing by the author about the understanding of the concept of Culture.

2. Ibidem.

teaching the cycles of aromas of plants, the climate required, as well as other indicators.

The physical and particular character of what we perceive through our senses is such that it is a product for immediate consumption; hence, its result.

The public understands and appropriates it. The professor should make the most of the fascination of perception. It needs no interpretation to train the student to the rationalisation of knowledge through the senses.

An example of exercise for the student, in order to help him rationalise the sensibility of spatial perception is the study of architecture *in situ*, namely through a visit to the Alhambra. At first, we would study the building in the classroom so that each student may choose a space where he would develop his own sensorial experience and the resulting rationalisation.

We will visit the site twice when it is closed to the public – in the morning and in the evening. The goal of the exercise is discovering, through the rationalisation of perceptive knowledge, a new plan of the Alhambra, a plan that reflects the space known through the different senses. Ultimately, the goal is making the student aware of the fact that space reflects something more complex than a univocal reality resulting from the material texture of some walls.

*Knowledge through intelligence.* The type of knowledge that follows perceptive knowledge is the one obtained by the human being through intelligence.

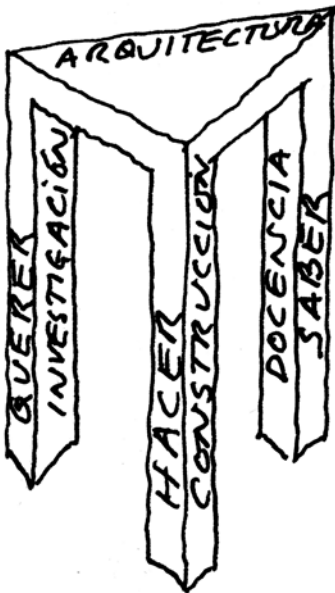
Intelligence lets us learn what we have known through the senses. Knowledge lets us overcome the appearance of things and reach their substance. The intellect offers us an objective and universal vision of reality. Since the intangible is not a product for immediate consumption, and rather needs to be absorbed, the education to reasoning will be more fruitful in a second phase of learning. For this reason, such practice should be reserved to advanced students.

The knowledge acquired through intelligence will rely on logic. It will provide the ground for the discussion about architectural design in the classroom. Therefore, there will be no danger of incurring in fruitless and dead-end discussions about designs whose only argument is represented by perception or subjective knowledge of reality, since such approaches are at the same time result and ways out. On the logical level, there are several options, all of them viable, such as knowledge through experience,

or empirical knowledge, or knowledge through consequentiality, or deductive knowledge.

Experience has been a recognised way to acquire knowledge since the dawn of humankind. Empirical knowledge relies on the active “trial-and-error” principle. During such process, the student tests his ability to learn through his own work – we might even say through the volume of work he produces. The more trials and errors undertaken, the more remarkable the learning.

The post-graduate courses system in North-American universities relies on the student’s empirical ability, as he produces a remarkable volume of drawings, and even more models, in order to acquire knowledge. For such method to work, two conditions are necessary. On one side, a remarkable maturity and ability to work; on the other side, the availability of a considerable quantity of material means in order to achieve such experiences. The role of the master will be to walk down that road with his student, and keep him away from the abyss of the absurd without, at the same time, keeping him away from obstacles. In this knowledge method, the weight of devotion falls on the student, as he is the one who is responsible, at any time, for the initiative.



The Table of Architecture. Explanatory drawing by the author about the understanding of Architecture.



Committee of the Architectural Design Workshop of the *Escuela Técnica Superior de Arquitectura de Madrid* with professors (from left to right) Alonso del Val, Campo Baeza, Aparicio Guisado and Sáenz de Oiza. The current professors Fernández Elorza and Jaque Ovejero appear among the students in the back, 1995

The final result, logically deduced from a premise, as a path toward knowledge, relies on the reflective principle of imagination. A path where the master will have to guide the student's progress by committing to a direct teaching<sup>3</sup>. The applied result must be solved first in our own mind, as we must not get our assumptions wrong. Such method can be achieved with a remarkable economy in terms of material means.

A significant example of this kind of deductive lessons is that imagination and words entirely replace the use of drawings, models, etc.<sup>4</sup>.

The knowledge, through experience, the master is supposed to convey to his student must rely on both approaches that, far from being conflicting, are instead complementary.

### Willingness

Willingness is the measure of will. If the master can guide his disciple along the paths of knowledge, through the senses or sensibility, and lead him to navigate the winding roads of intelligence, he can do nothing without the student's willingness to undertake the learning process.

Willingness is a personal and non-transferrable power, embedded in the principle of freedom we mentioned at the beginning.

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3. Some of the issues the architect must meditate on are History; Masters; Buildings; Discipline; Scale; Measure; Light; Shadow; Material; Idea; Structure; Colour; Function; Form; Analysis; Space; Place; Man; Time; Technique and Construction; Gravity.

4. As an example of these two paths to knowledge through intelligence, I will rely on an account of how my two elder twin sons learnt to walk. While one of the two learnt through the active principle of falling, getting bruised and getting up again several times until he was able to walk, the other did so through the reflective principle of observation. He observed how his brother was learning, and was able to walk since his first attempt. Hunting might provide a further example – the empirical approach being hunting with a repeating rifle, and the deductive approach hunting with a bow and only one arrow.

For the teaching activity to be successful, both the willingness of the master to teach and the willingness of the disciple to learn must be in place.

The latter is particularly essential since, as we underlined before, in the realm of architectural design, teaching occurs before learning.

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# FAIL, FAIL AGAIN, FAIL BETTER. THE QUESTION OF THE VALUE OF TEACHING ARCHITECTURE

Cino Zucchi

«If language is barely a suit, it will become threadbare and old-fashioned. Up to that point, one can still go around. A smoking jacket does not make one immortal – merely appreciated. But, recently, what do young people wear? A language that is only made of epithets! A fabric-less suit, only made of buttons!».

Karl Kraus, *Dicta and Contradicta*, 1909

«Why all this eagerness to invent every time a new writing, when the old one still has so much potential? (...) Schools should only teach the rules of ancient tradition, because it is impossible to teach unruly, defective and random things».

Josef Frank, *Architecture as Symbol*, 1931

«Young people today are suddenly in the position that ordinary common sense no longer suffices to meet the strange demands life makes. (...) For it is not enough any longer to be able to play the game well; but the question is again and again: what sort of game is to be played now anyway?».

Ludwig Wittgenstein, *Vermischte Bemerkungen*, 1977  
[*Culture and Value*], 1980

My opinion about “teaching architecture” is clearly illustrated in a text I wrote in November 1997<sup>1</sup>, which represents a point of view about teaching that I still find viable. In the short story *Pierre Menard, Author of the Quijote*, Jorge Luis Borges shows how the meaning of a sentence may change depending on the point of the temporal vector in which it is uttered. The same happens, for example, with the concept of “academia”, which acquires almost ironic connotations when it is used in the age of the Internet. The temporal drift also becomes a semantic drift, and I find it interesting to revive an “out-of-fashion” meditation as a contribution to collective thinking about the effectiveness of the university institution.

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1. ZUCCHI Cino, *Insegnare l'architettura*, in “Architettura-Intersezioni”, 5, 1997.

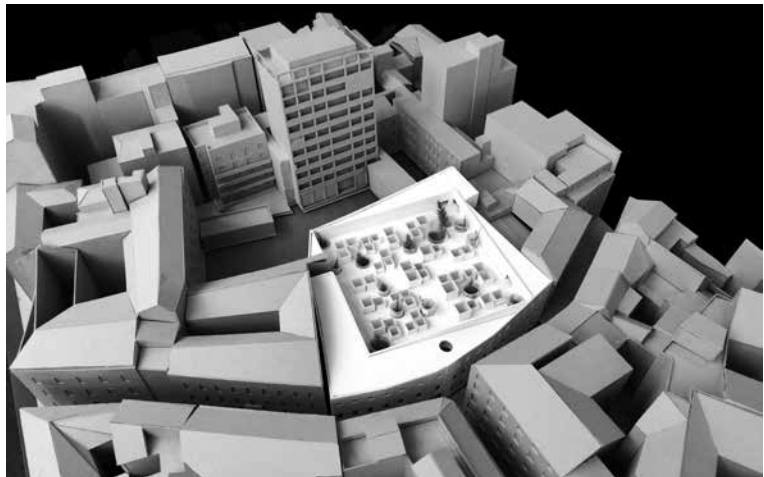
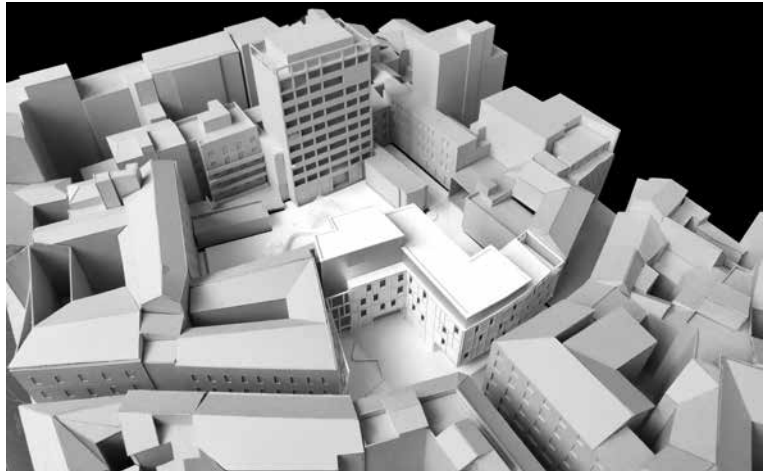
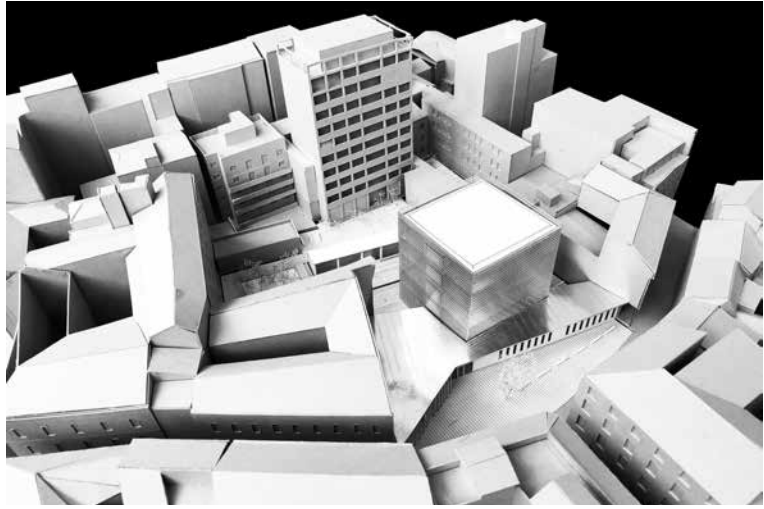
**D**uring the 1960s, there was a reaffirmation of the concept of disciplinary autonomy in the school and in architectural theory, versus a then largely exhausted version of the Gropiusian “method”. If the latter was spurred by a puritan sort of iconoclasm, the former produced a sort of undesired result, which is merging the notions of “value” and “form”.

Thus, the forms of architecture have been established as independent variables, by recognising their immanence with respect to those theories that viewed them as the mere “result” of a decision process. This is not necessarily a bad thing – we may variously share the idea that the language of architecture is unreformable as a whole, on penalty of sliding in a form of hermeticism or of *Kitsch*, which, by the way, seem to be ineradicable constants of the modern experience.

However, such supposed autonomy has established the forms and their basic combinations, most often by ignoring the relationship between them and a “performance”, whether it be of a constructional, distributional or representative nature. As soon as we stopped seeing the architectural object as the response to a need, although complex or of difficult formulation, we started to observe a conceptual conflict between essence and appearance, between contents and signs, whereby the latter are exhibited not much as to signify the former, but in a way that erases and replaces them. The school generated a syntax of forms now devoid of content, which from time to time reassembles itself into products for internal use, only understandable as “style exercises”.

I do not think this situation may be amended or subverted through a mere oscillation of the ideological pendulum, by reaffirming the priority of “method” over form.

As argued by Ernst Gombrich in his brilliant essay *Art History and the Social Sciences*, each society cannot guide or lead its own cultural activity by ignoring the



Cino Zucchi,  
*Architectural Design  
Studio*. Study model  
of students' works,  
AUIC School,  
Politecnico di  
Milano.

presence of canons, shared value judgements, in a certain sense not manifest in their undisputed obviousness: «Civilization, one hopes, can be transmitted; it cannot be taught in courses leading to an examination. [...] What we call civilization may be interpreted as a web of value judgements which are implicit rather than explicit».

In this sense, we may think of civilisation as a subtle constraint of behaviours and judgements, a sort of formal convention that makes exchange and learning possible. Traditional teaching of architecture relied on a quite clear axiom – the belief that classical forms inherently included the rules of their combination, and therefore were themselves the repository of the canons of good architecture. The dissection made by Durand on the body of architecture triggered the modern separation between “forms” and “rules”. Once the compositional system of the Beaux-Arts (think of Guadet’s diagrammes about composition relying on hierarchically ordered symmetry axes) was in place, it could be separated from language; the plan itself can generate buildings of entirely heteronomous styles.

In *Notes on the Synthesis of Form*, Christopher Alexander distinguished between two types of learning in the arts – a traditional approach aimed at achieving the result through a pragmatic behaviour, and by correcting the student without making the reasons for such correction explicit; and a modern approach that tends to isolate a “method” from its specific results, or to separate theory from training. «At one extreme we have a kind of teaching that relies on the novice’s gradual exposure to the craft in question, on his ability to imitate by practice, on his response to sanctions, penalties, and reinforcing smiles and frowns. [...] The most important feature of this kind of learning is that the rules are not made explicit, but are, as it were, revealed through the correction of mistakes. The second kind of teaching tries, in some degree, to make the rules explicit»<sup>2</sup>. The modern notion of teaching “through disciplines”, with its supposed separation between process and formal result, is the logic continuation of the latter model, of this trust in the power of “grammar”, and in its replacing the “language”.

How can we teach architecture today?

From the modern movement, we inherited fragments of

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2. ALEXANDER Christopher, *Notes on the Synthesis of Form*, Harvard University Press, Cambridge, Massachusetts, 1964, p. 35.

methods. However, we lost the underlying values that in certain sense legitimised it. Those were not so much ideological as more properly technical values, such as features of a hygienic, economic, distributional nature. In this sense, the notion of “method” now contains as many *a priori* constraints as the indiscriminate adoption of an “institutional style” in the course, usually the one of the professor or of the movement’s founder.

Therefore, it is not a matter of denying any formal or methodological *a priori* principles (one can only see by adopting a “point of view”), but of separating the identity of these and the result. Nothing is more evident in the teaching of architecture than the confusion between means and goals.

In doing so, today it is vital to distinguish between the concept of disciplinary heritage and the concept of “value”. While grammar may assess the correct construction of a sentence, it is unable to explain why it is necessary to utter that sentence rather than another one, or to help to make that choice; the quality of design, as the meaning of a sentence, must be measured against the backdrop of a situation, of an actual or desired goal.

To give just one example, we may consider the issue of solar orientation in design. The relationship between the rooms in a house and the cardinal points has always variously played a role in traditional architecture and in classical treatises; nineteenth century hygienism, which emerged to address poor housing conditions, generated a gradual scientification of such issue. Within functionalism, the concept of “heliothermic axis” summarises such concerns into an apparently subjective formula that establishes the orientation of a double body by balancing the solar radiation the elevations receive with the temperature in the morning and in the afternoon, and therefore by deviating slightly from the north-south axis towards the west in order to favour morning radiation. However, the “technical” concept of heliothermic axis implicitly contains several *a priori* features, including the notions of open building, seriality, denial of the existing urban form. Therefore, we may consider that the issue of a good solar orientation should be applied in certain cases as an alternative to other parameters, such as, for example, those of the respect for the urban morphology of a given context. Should we respect the heliothermic axis in the historical centre of Bologna? Such decision implies that we should make our goals explicit before we apply the technical knowledge at our disposal.

Therefore, a certain form, a design, particularly in the

educational environment, can be assessed only in presence of a range of explicit values, be they even of a purely formal nature.

If civilisation is not required to make its values and canons explicit, the teacher is somehow obliged to do so.

However, there seems to be no codified system of values outside design that may become a certain reference. Thus, the word “quality” only seems to acquire meaning when the parameters according to which we assess it are made explicit.

Today, it is necessary to establish the question of value and of quality within the individual design every time, or as an integral part of the very act of designing. Different situations may generate radically different priorities and goals. In doing so, the experience of the individual cannot possibly acquire the status of value; the notion of value is necessarily a collective notion, even with the contradictions this implies. Establishing a value means experimenting its ability to be shared. Therefore, the notion of value does not generate the form but rather “falsifies”, and tests it.

So far, I have distinguished between two complementary educational approaches: the “academic” basically imitative approach (neither term has a negative connotation for me), whereby the values are transmitted in an implicit way, organic to a culture of form; and the “methodological”, strongly maieutic approach, whereby the values are constantly made explicit, and forms are treated as epiphenomena.

I would like to introduce a third notion that we may identify with the term of technique against these two approaches. While the concept of “method” evokes an abstract diagramme, a sort of logic of the design process as separated from its object, the notion of “technique” contains two important ideas. The first one concerns the relationship between behaviour and “resources”, be they inherent to or outside the discipline, either material or spiritual; in other words, it eliminates the idea of a generalised grammar in order to explore the actual design processes in the actual conditions of its existence. The second one concerns the relationship between individual knowledge and collective knowledge, or the problem of the transmissibility of knowledge, of the exchange between world of ideas and physical world.

In this sense, the notion of technique contains at the same time the data of the problem, the interpretation of their mutual relevance and, through the introduction of formal models, also and necessarily a problem of representative or thematic nature.

Representation does not appear in the form of the classic

definition of architecture as “allegory of the art of building” (Shelling), but rather as an inherent fact, as more or less spontaneous configuration of the data into architectural forms.

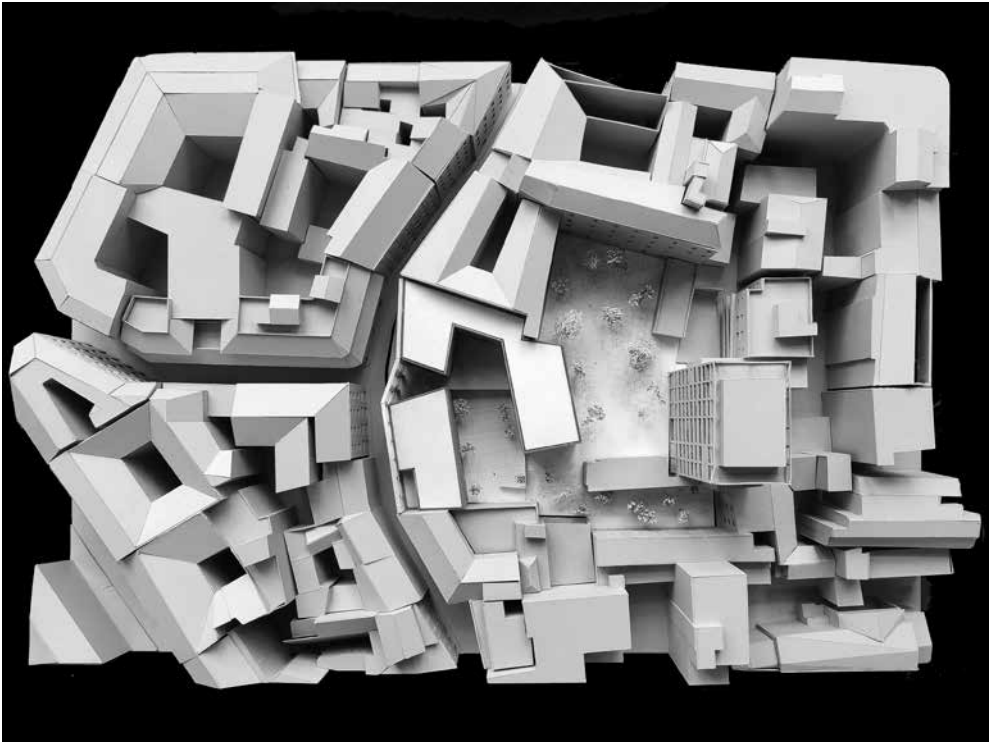
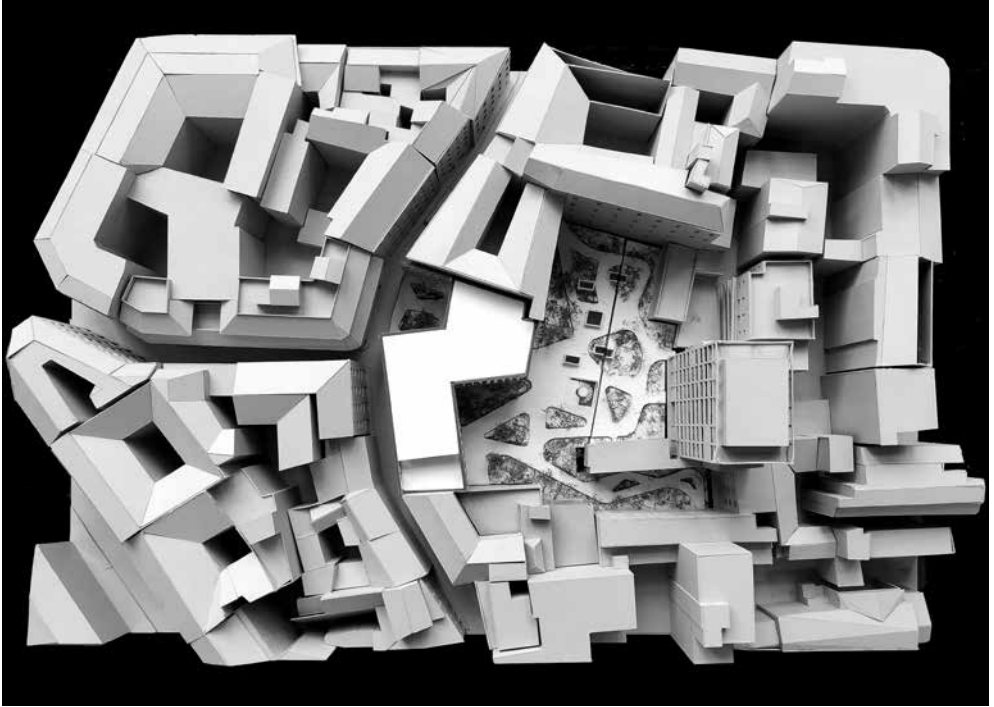
In this sense, technique coincides backwards with the model, the design result with the conceptual schemes that generated it. Such meaning implies the end of the idealist opposition between idea and means, and of the opposition between “useful arts” and “fine arts” argued by Dewey, as art, in general, defines “the coincidence between means and goals”.

Such concept of technique as something separate from architecture is precisely what brings the latter to operate as mimesis of the former, a figured representation, so that construction does not become a process but rather a symbolic object, as clearly demonstrated by Ezio Bonfanti in *Emblematica della tecnica* [Emblematic of the technique].

If we refuse the nineteenth-century idea of an “aesthetic” architecture, it can only be “technical”, in other words concerned with its own conceptual and material means of production. However, precisely for this reason, technique will cease to be an object of representation in an iconic sense (as, after all, it was in most modern architecture), and will become the very structure of form, and therefore disappear from the point of view of the content.

Obviously, several issues remain unaddressed. One is whether the quality of the design experience in the educational environment may be assessed in itself, or only for the effects it may produce on the individual. In other words, the question is whether there is a coincidence between quality of the design and quality of the educational experience. For example, whether a student may learn from a flawed design, or whether, on the contrary, a perfect product may often hide principles that are deeply consumed by the academic tradition of the group.

Another emerging problem in design education is the relationship between academic design and reality, summarised in the particular figure of the teacher who represents the only critical counterpart of design. Simulating the conditions, boundaries and resistance a design encounters in real life appears impossible, and perhaps uninteresting. However, the question of realism, as the question of utopia, or if nothing else of the critical distance of design from the set of decisions that regulate the form of the city, has been a seemingly uncomfortable issue for years within the academic community. As a result, graduation committees often find it difficult to recognise where the thesis design may





stand within the more general frame of architectural culture, and a system of values outside the design itself, due to its inability to express either support or criticism towards the practice and its emerging as an entirely tautological result of premises built precisely to ensure its legitimisation.

As the civilisation mentioned by Gombrich, school can only exist as a society of equals that chooses and stabilises certain canons in a collective form, all while being capable of rediscussing them when they become empty, tiredly repeated formulas. Perhaps, today we are not able to communicate a civilisation. As Loos used to say, we are “uprooted”, now deprived of that kind of innocence – and confidence – resulting from an unconscious convention. However, if we cannot teach civilisation, perhaps we can help students to develop their own cultural geography, or a range of points of reference that allow them to understand where they stand. In any case, keeping on addressing the university issue as a problem of numbers, resources, organisation charts is useless. As Gombrich argues, «The Annual Reports of our Departments and Institutes should present them as veritable beehives of activity [...] Like most industries, ours finds itself confronted with the problems of overproduction and – if the truth is to be confessed – with the danger of polluting the environment. The ‘fall out’ of the academic industry is the pretentious jargon that seeps into language. What is needed [...] is not yet another lobby for more grants and research projects, but rather a forum for the exchange of views on what constitutes worthwhile research»<sup>3</sup>.

The thing to do is rebuilding a critical dimension by teaching students how to develop and discuss their design proposals and how to argue for them both with their professor and with their fellow students. Only a horizontal relationship among students – and professors – may restore that subtle network of codes and exchanges that turns a “service” into a community. As Paul Valéry argued: «Academicism is, all in all, nothing but a more or less conscious preservation of more or less illusory criteria of objective judgements»<sup>4</sup>. We may still call the academic community an “academia” if by this word we mean a place for the discussion of values, an attempt at the partial objectification of the subjectivism that currently permeates architectural practice.

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3. GOMBRICH Ernst, *Ideals and Idols. Essays on Values in History and in Art*, Phaidon Press, New York, 1979, pp. 115-116.

4. VALÉRY Paul, Degas Danza Disegno (1936), in “Scritti sull’arte”, Abscondita, Milan, 1984, p. 42.

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## DO NOT FAIL. TEACHING AS AN ENDLESS DIALOGUE

Emilio Tuñón Álvarez

**T**eaching architecture, precisely like architecture, implies a description of things and of ourselves and, at the same time, a personal reaction to the enigma of our existence, as the only real inspiration in life, and by extension in architecture, derives from opening our potential to an actual dialogue with a complex reality.

Today, we can say that the ability to teach the practice of architecture cannot consist anymore in a set of unchanging rules and notions (transmissible through a set of hierarchical ideas). Instead, it must reflect an open sensibility towards the world, which is a prerogative of professors, students, professionals and enthusiasts.

Therefore, architectural education must create a playground where everyone learns and teaches; an empty space to be filled with passion and work and where we who are dedicated to teach architecture may give a meaning to our vocation.

Teaching architecture means performing a job open to multiple deviations in the discussion, as any teaching relies on the act of sharing private notions and obsessions through the transmission, catalysed by personal interests, of a set of universal experiences.

Teaching architecture is a form of thought that must encourage us to open ourselves in order to learn from everything around us, not only by adopting a passive expectation towards our surroundings, but by actively immersing ourselves in this constantly changing world.

The goal of teaching architectural design thus understood is aiming neither at recomposing a line of thought or of all-embracing research, nor at letting ourselves drift towards the variants of a univocal path. On the contrary, its goal must be expanding the playground of architecture through the critical integration of a set of concepts and arguments derived from other disciplines that may nourish this

uninterrupted dialogue, this progress spurred by the evaluation of ideas and forms through endless attempts – the procedure that underlies our activity.

Indeed, learning to design is an open path we trace precisely while we progress, in part by meditating and in part by perceiving in a sort of orbital reflection in which the very approach allows to provide things with a personal form.

Therefore, teaching architectural design may start from a condition of circumnavigation, of approach, from a thought built by sequential attempts, capable of turning into a meditation firmly rooted in the individual and whose integrity guarantees a coherent result. Therefore, this approach has parted ways with a positivist mindset that has lost both its meaning and its operational viability, as its cohesion inevitably resulted from an ontological device placed beyond time and space.

### **Thinking through sequential attempts**

In this confrontational age, architectural education can only rely on the existence of a community of professors whose cohesion only results from a set of shared values and goals. However, such community cannot keep on sharing a sort of provisional humanism resulting from the acceptance of the fact that particular circumstances represent the starting point of a path guided by a thought that proceeds by attempts and takes the form of an uninterrupted dialogue. In such dialogue, theory and practice do not appear as separated, as the job of learning and teaching architecture relies on the insisted re-description of the constraints and contradictions of a changing reality.

In this dialogue, we try to ignore a whole set of traditional, useless or obsolete questions in order to replace them with new and hopefully more interesting others, by leaving behind rationalist certainty and objectivity understood as goals, in order to immerse

Arthur Fellig  
(Weegee), *Coney  
Island, New York,  
1940.*



ourselves in a pragmatist thought, understood as a form of knowledge that integrates a heterogeneous range of ways of thinking.

In its addressing the world around us, such dialogue becomes charged, in its development, with unforeseeable meanings. Moreover, both what is said and what is not said count in it.

This dialogue promotes the establishment of a changing relationship with the objects and meanings of life, a relationship oriented sometimes towards time and history (understood as collective representation) and sometimes towards space and memory (understood as a private experience).

This uninterrupted dialogue starts from the dialogue between universal and particular languages (as history implies a collective representation and tries to define a universal language, while memory is a purely private experience that underlies the particular language). Such dialogue generates lines of flight that redefine a contingent reality deformed by one's own individuality.

Indeed, teaching architecture implies a personal meditation about the world, the traces of human activity, as well as observation and thought. Therefore, the skepticism typical of the enthusiast and researcher about the existence of a higher truth traces a space for a lower reason, a place where the enthusiasm for ideas and the awareness of their contingency coexist.

Therefore, in teaching architecture, as well as in architecture itself, one should not try to create impregnable models of

thought, and rather analyse agreements and disagreements between general and personal education, with the only goal of understanding architecture and life as highly limited supports that may help our essential pursuit of happiness.

**Towards a potential architecture**

The non-theoretical method of dialogue proposed in this educational project is a creative form that takes things literally, in order to highlight the contradictions and frictions between objects and ideals.

Only those who consider the starting constraints (the set of regulations that superpose and contradict each other, the changeability of programs, the speed of social changes, the unpredictability of human behaviour, etc.) as a creative opportunity rather than a limitation will be able to practice this profession seriously.

The architecture society requires nowadays is, indeed, a potential architecture that understands the work of architectural production as the result of the either inherent or outer constraints and limitations of the discipline itself.

The fundamental pedagogical goal of teaching architecture is promoting a practical training to architectural design, resulting from the view that the design procedure is an uninterrupted dialogue that in turn results from the dialogue between particular and universal languages.



Lisette Model,  
*Running legs Forty*  
*Second Street, New*  
*York, 1940-41.*

In general, and as obvious as it might sound, professors and the School of Architecture must provide their students with the wide-ranging and in-depth education required to address the problems of architectural production without sacrificing the inevitable and personal mystery represented by method and creativity.

In other words, the professor, starting from his own knowledge and critical conscience, should be able to open research paths by showing the student the inherent logic of the rights and wrongs of design, by referring to those examples in his discipline where thoughts and obsessions materialised and by underlining the contributions provided by such examples to public requirements.

Moreover, the professor must illustrate the instruments and methods required to perform expansion and exploration, extension of the scope and focus, used in the past by other architects whose works reached such goal. More importantly, he should teach his students to take advantage, through study, of the best professors – the masters of contemporary architecture.

### **In-depth observation**

In general, as it is usual in the teaching of design, the method should consist fundamentally in the proposal of actual design hypotheses that, as such, highlight agreements and disagreements between ideas and forms, concepts and instruments, individuality and totality, as well as between our obsessions and public requirements.

One should always place simultaneously on the game board outside factors (the actual data of reality), inside factors (elements related to the student's private knowledge and obsessions) and what remains to be done (the technical project to be developed in a specific place) through a constant process of expansion of the visual field and of focused observation, as thought should always survey what is undefined and widespread in order to proceed to a densification and in-depth exploration required to materialise moments of higher intensity and clarity.

The student's practical work comprises several superposed, transversal and connected layers. A first layer of research and critical analysis of reality and its constraints belongs to the universal realm; a second layer of conceptual setup belongs to the personal world; a third layer of design development results from the dialogue between universal and personal languages; finally, a



fourth layer of materialisation of the actual proposal must imply a projection towards the future.

Any design work requires first a survey and an analysis of reality on a two-fold level – personal experience and universal experience.

In terms of personal experience, it will be necessary to describe one's knowledge, personal skills and private obsessions. At such level, moreover, it is useful to develop a catalogue of ideas potentially applicable to designs or other life experiences to be implemented in the future.

In terms of the universal experience, the student is required to develop, through books, publications and travels, a culture of design that embraces issues of a conceptual, formal and technical nature. The goal is reaching the materialisation of an architectural catalogue that allows locating and knowing what already exists.

This preliminary phase of research and analysis implies the development of a set of personal documents to be shared with fellow students in order to expand the playground of the group involved in the discussion about the same designs. Once the gathered information is available, the design phase takes place by means of graphic systems (hand drawing, computer-aided design, working models, photographs and photomontages). During this phase, the student is mainly required to produce written

Danny Lyon, *Cell Block table*, Ferguson Unit, 1970.





Eugene Smith,  
*Courtroom* (from  
Pittsburg), 1955-56.

materials in order to explain his personal position towards the identified issues, as well as the ethical, conceptual and technical feasibility of the proposals.

As previously explained, this analytic-propositional process always implies a trail of possible expansions and descriptions, of deviations and eventual explorations.

It is important to stress that during this phase the professor must stimulate research about design tools and their potentials, all while avoiding an aesthetic assessment of partial results and merely practicing an analysis of their conceptual and technical coherence.

The final work must rely on the same graphic tools used for the previous procedure. It is necessary to clarify how it is often possible to opt for a limitation and standardisation of the proposals by normalising formats, contents, scales, representation systems, materials for the construction of models, etc., in other words by circumscribing the students' scope of expression in order to achieve a deeper and more focused result for design research in its purely disciplinary values.

For all the projects, it is necessary to analyse the properly physical and technical aspects required for their materialisation. Indeed, in spite of the virtual nature of teaching, it is necessary to keep in mind that the final goal of architectural design education

is closely related to the vocation to build objects and operate within specific contexts with actual physical features. In other words, the final goal is testing a potential architecture through a set of actual technical and building systems applied to specific, natural or man-made contexts in the various levels of natural layout in order to produce transformations and programme changes.

The critical thought the professor shares with his students is articulated through a series of theoretical lessons. The purpose of such lessons is focusing the observation on certain aspects that may stimulate constantly the personal interest and design work, although such phase will not result in a neither complete, nor excessively structured exposition.

The themes of the different lessons address a set of elementary design strategies and tools, as well as a set of transformations and programme changes in complex territories related to different working contexts proposed as actual case studies.

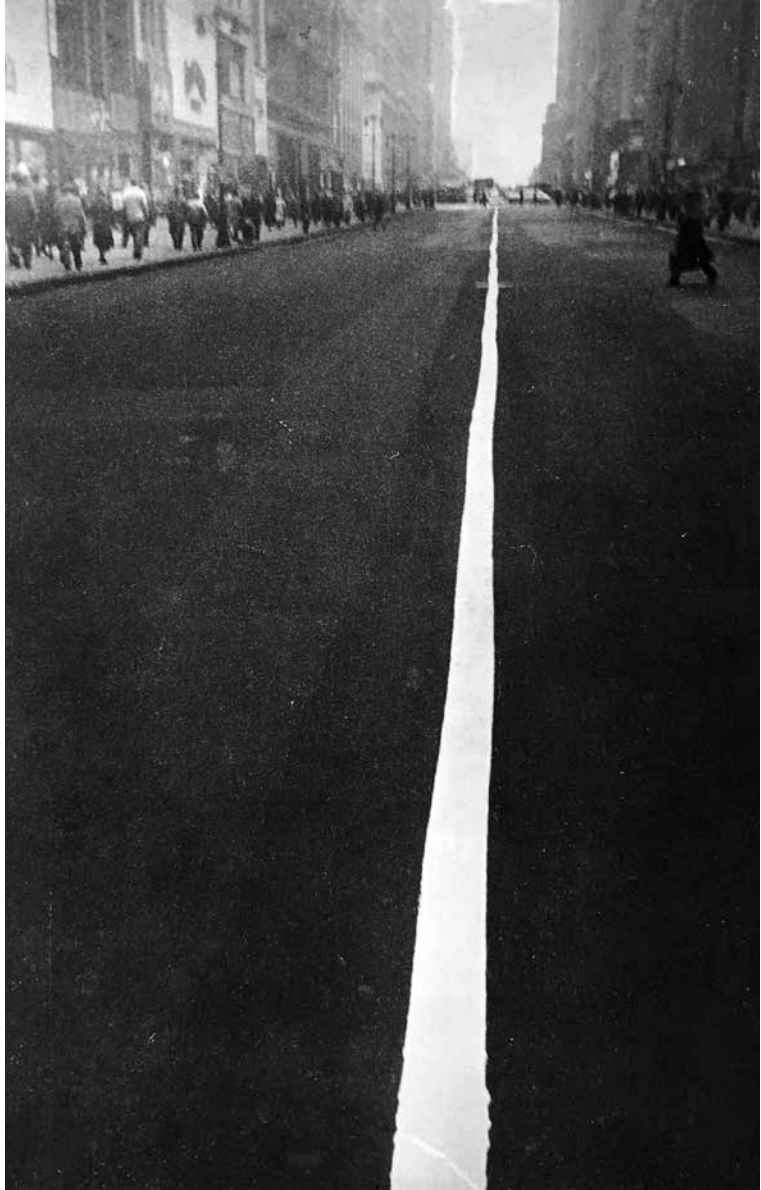
Therefore, it is necessary to develop general lessons about strategies and tools, thought by attempts, the relationship between tools and form, human trace and the creation of places, the relationship between body and space, identity and diversity, repetition systems, the concept of field and singularity, etc. However, it is necessary not to overlook the lessons devoted to the complexity of the territory where contemporary architects work by analysing issues such as transformations within the contemporary city, work within historical contexts, interventions in informal urban planning areas, programme changes and transfers between agricultural-rural and urban contexts, interventions in industrial areas, changes from landscape to infrastructure, etc.

In a complementary way, it is necessary to provide other more specific lessons aimed at helping the student to learn about an actual project or the work of an architect the knowledge of which may complete his education and encourage him to meditate on the methods for the actual solution to an actual problem. The last type of lessons we are required to provide are those resulting from the very development of the exercise and work of students. Such lessons must imply a more precise focus on the programmes or the exploration of other aspects of the design activity.

### **Shared thoughts**

Everybody knows that workshop lessons represent the traditional basis for architectural design education. Workshop lessons require a combination of work in the classroom, personal

Robert Frank, *Untitled*,  
1948.



consultation and a set of collective critique sessions, during both the development of the exercise and its finalisation. At the same time, collective corrections should prevail over individual corrections since the latter often reduce or limit the educational goals of the different exercises.

Being a fundamental teaching tool, critique sessions should be frequent and convey the concept of critique as the discovery

of the devices used by the designer, including elements of an unconscious nature, in order to submit them to debate and discussion about the possible alternatives.

Such sessions provide a valuable knowledge of the work developed by other students, and act as an incremental factor for personal learning. Moreover, their organisation should promote the participation of students at various levels of training as well as of professors involved with other groups or disciplines.

In this sense, it is very important to underline the relationship between teaching and social sharing of ideas, as it is clear how the educational realm expands whenever professors and students share their knowledge that, through their exposition, automatically pass from the private to the public domain.

The idea of the workshop and classroom as grounds for shared thoughts amplifies the effect of a sort of cooperative of thoughts in which frequent public presentations enhance the exchange of information about the working space, the possible conceptual approximations proposed for the problem at hand, including the exchange of productive strategies and actual technical solutions, in a way that promotes the idea of learning understood as an uninterrupted dialogue.

Once normal daily teaching is defined in these terms, it is necessary to expand its scope by including a range of lectures, *lectio magistralis*, exhibitions and personal presentations of actual projects organised by the different Departments of the School of Architecture of Madrid or by other bodies and institutions beyond the School itself. The accessory elements to the working method described above necessarily include visits and trips. Organised in order to explore architectural, urban planning and landscape design works particularly interesting for the students, such visits are necessary as supports to their actual exercises and for general workshop teaching.

It is necessary to underline the importance of such visits within and beyond the city where the School is located. The professor will provide a preliminary explanation of the visit so that the students may prepare with research and information gathering, as well as the equipment required during the field trip – notebook, drawing materials, measuring tape, camera, etc.

In terms of the tools that complement architectural design learning, it is important to mention the relationship of architecture with the media, as today, the proliferation of information, magazines, books, web sites, and blogs provides students the

opportunity to access a huge amount of cultural, technical and conceptual information. The students, in turn, must be able to analyse such information in a critical way in order to discern what is actually interesting for their architectural education from what is merely part of media noise in our accelerated digital culture. We live in an exciting historical age when it is necessary to learn many things and quickly finding one's position in order to access as many opportunities as possible, all without losing one's critical ability.

Now more than ever it is possible to consider flexibility and opportunity as the frames within which human freedom develops. In such context, architecture is required to react in a fast and efficient way by exploiting the power and potential of life and of communication, based on the assumption that teaching and learning architecture rely on the idea of an endless dialogue between object and subject, abstract and concrete, artificial and man-made, functional and constructional, and more importantly between student and professor. However, for that to be possible, it is necessary that both students and professors do not fail in their mission...

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## THE SCHOOL OF MILAN AND THE SCHOOL OF MADRID: COMPARING MODELS

Jesús Donaire García de Mora

«I feel invigorated by the interaction and dialogue with the students. In a spirit of giving back to the field, the teaching exchange has also kept me on keen focus with the potentials of architecture as it has changed in the last decades. I have learned many things over the years, and consider myself still a student continuing to learn».

Steven Holl, 2014

**S**teven Holl replied in this manner to Josephine Minutillo's question, «How does teaching enrich your practice?», in an interview for "Interior Design". His answer reflects a quite common experience among architecture professors about the mutual exchange of knowledge and stimuli between themselves and their students. While the professor conveys the experience and knowledge acquired on the field, the students participate in the exchange with their energy, stimuli and powerful creative ingenuity, in a way that reveals new frontiers for the knowledge and practice of architecture.

Teaching architecture is far from easy. Its very definition as "the art of designing and building buildings"<sup>1</sup> reveals the two-fold, creative and technical, nature of this discipline. The professor's mission is not merely conveying a set of notions – it also entails stimulating the students to develop their own creative skills. In many cases, this two-fold nature turns into an academic ambiguity that, in time, has inevitably generated two types of Schools, some being more artistic and others more technical, while these two realms should actually be interrelated and find a mutual balance.

The Polytechnic Schools of Milan (AUIC) and Madrid (ETSAM) boast, instead, an indistinct and simultaneous allegiance to both realms.

Indeed, their academic programmes successfully reflect such delicate balance. Such ability is what propels the two Schools of Architecture among the top institutions in Europe as major reference points in terms of quality, two schools that "manufacture" architects and equip them with an excellent training. Two sisters, almost

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1. From the Latin, *architectūra* = the art of designing and building buildings (Real Academia Española de la Lengua).

twin Schools that share a strong technical identity and a remarkable design ability, two true hotbeds of ideas. Both Schools may count on two remarkable driving forces – on one side, a diverse and qualified faculty and, on the other side, passionate students with a high working capacity. Moreover, both Schools belong to two constantly changing cities characterised by urban development policies that emerge as ideal case studies for the critical and analytic activity developed by professors and students. Major urban plans such as the recent *City Life* in Milan and the development of the *Madrid Río* plan or the future expansion of *Madrid Norte* testify to an interest for the city and its residents that reflects directly on the Schools of Architecture.

Preserving this kind of both technical and creative Schools of Architecture is not an easy task in a world like ours – a globalised world governed by market laws and increasingly fast changes. On one side, it is necessary to consolidate the foundations of these Schools in order to preserve the identity they traditionally convey, while, on the other side, constant updates and propositional reviews are equally necessary in order to demonstrate their integration within our globalised world. Beyond such general aspects, keeping these Schools on the front line also means stimulating their faculty, or the element that actually represents the driving force of a top-quality education. This is not always easy, as these are public universities with limited economic resources. However, it is a battle we should never stop fighting. Therefore, the university should strengthen the role of its most qualified professors.

The dialogue between two Schools of Architecture provides the opportunity to highlight the importance of keeping a faculty adequately stimulated, as well as – and in a more incisive manner – of emphasising the role the architectural education provided by both Schools plays in the society and the responsibility such role entails. Both Schools are admittedly facing a complex future at a both social and political





level within a world characterised by an exponential technological development, and in a clearly unstable political context in both countries.

Given how architecture is directly dependent on the economic climate, this is an inescapable issue. Indeed economic policies directly affect the quality of architectural space and urban development of our cities, a quality that constitutes architecture's major responsibility. In this context, the social role of architects inevitably emerges as a key element for the quality of our cities, and for the improvement of their conditions through the knowledge and respect for increasingly stringent regulations, at the same time aimed at making construction and building increasingly safe.

At the same time, the analysis of the state of architecture both in Italy and in Spain has brought to light the well-known problem of the high number of students, in turn reflected in a constant increase of new placements of architects in various sectors of the job market. The two Schools cannot ignore such situation given their key role in this realm due to the high number of their students, and the clear and direct consequences of this phenomenon. The job market, at least as we have known it so far, cannot absorb such a high number of professionals in this sector.

This situation generates a constant and extreme competition – a situation that in principle might even be positive but, in practical terms, triggers a remarkable reduction of fees, with highly negative consequences on the economic returns both a graduate at his first job and more experienced professionals may aspire to, while they see their wages stuck for years.

The alternatives inevitably entail a redefinition of the role of architects, of their creative foundations, expectations and potentials in professional terms. According to recent surveys, in Italy there are 2.5 architects per thousand inhabitants<sup>2</sup>, while in Spain, the ratio is 1.2 architects per thousand inhabitants<sup>3</sup> – both figures are exceedingly above the European average. Since it is seemingly impossible to change such situation, the solution is to be found in the Schools themselves, and in their ability to promote an expansion of professional boundaries aimed at embracing realms hardly explored in the past, but not for this less important and

Jesús Donaire  
García de Mora,  
Maria Francesca Di  
Gennaro, *Laboratorio  
di Progettazione  
Architettonica 3*,  
AUIC School,  
Politecnico di Milano  
2018.

Presentation of  
projects  
of the *Laboratorio  
di Progettazione  
Architettonica 3*, held  
by Jesús Donaire  
García de Mora at  
the Politecnico di  
Milano, with Alberto  
Campo Baeza, Manuel  
Blanco Lage, Jesús M<sup>a</sup>  
Aparicio Guisado and  
the students of the  
Milan School,  
Milan 2018.

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2. Data from the Italian MIUR (Ministero dell'Istruzione e Ministero dell'Università e della Ricerca [Ministry of Education and Ministry of University and Research]).

3. Data from CSCAE (Consejo Superior de Colegios de Arquitectos de España [Higher Council of Colleges of Architects of Spain]).

relevant. As an early pioneer in such exploration of new realms, Italy has successfully achieved a solid international reputation in several sectors of design thanks to major architects-designers like Franco Albini, Gio Ponti, Achille Castiglioni, Ettore Sottsass or Gae Aulenti. However, many other, not only creative sectors, related to industrial design and exhibition design, as well commercial sectors or realms related to territorial management, project management and innovation in terms of materials, construction methods and technologies would provide promising frontiers for the Schools' action. In such sectors, the university is required to intensify its relationships with the industrial world, which, along with professors and students, forms a team with a high research and development potential.

From this perspective, students should be considered as “producers” rather than mere “consumers” of our education offer. Indeed, they are the protagonists of society's new trends and requirements and play a fundamental role in the production of contents.

During my experience as a professor at ETSAM since 2009, and of visiting professor at the AUIC School since 2016, I have been able to experience the generational change that turned students from mere “spectators” into “protagonists” of the way architectural design teaching is imparted.

Their skills and the technological tools at their disposal (software, fab lab, information access, etc.) have boosted initiatives that successfully enhanced the professor-student dialogue.

In a certain sense, the student has begun to impose his own agenda by requiring a change of direction, in particular towards less conventional and more topical design issues. These include the solution of problems resulting from natural disasters, building requirements in specific areas of the planet, creation of new production opportunities in non-urban areas, exploitation of the existing heritage, etc. The interest of Schools of Architecture for such increasingly important issues actually started, albeit slowly, as early as the 1960s and 1970s, in coincidence with the emergence of social, political and economic issues such as the access of women to the job market, the economic consequences of globalisation, sustainability and protection of the environment, as well as the relationship between students and professors. At the time, architects of a more academic profile such as the Italian Giancarlo De Carlo, a member of the *Team X*, laid the foundations for a more democratic, open and participatory management of architecture and, as a consequence, of its education,



Exhibition of works developed during the *Laboratorio di Progettazione Architettonica 3* held by Jesús Donaire García de Mora at the Politecnico di Milano, 2018.

thereby questioning not only traditional education but even the relationship between architect and society.

Both AUIC and ETSAM may count on an increasingly international student body, thanks to globalisation in the university environment and, more specifically, to a wide range of exchange programmes. Indeed, both Schools consistently count on students with both a two-fold creative potential and a high working ability. In this context, it is important to support the key intellectual figure of the professor as a guide and an educator. In the past, the vast majority of great architects and architecture professors always boasted leadership skills and an ability to inspire future generations, and this creates a powerful and enduringly fruitful master-collaborator or master-student chain. In this vein, Alberto Campo Baeza often underlines the importance of combining teaching, practice and research, understood as indispensable tenets for this intellectual role model.

To this end, time, devotion and an extraordinary passion for the professional and the teaching activity are necessary. A teaching that stems from learning the use of reason as well as of the senses. The Schools of Milan and Madrid provide an excellent example of educational institutions where professors become masters and role models. The student should follow the inspiration of his own instinct in order to discover such figures who specifically focus on the various realms of architectural knowledge, thereby achieving an education nourished by an array of registers.



Alberto Campo Baeza meets the students of the *Laboratorio di Progettazione Architettónica 3* held at the Politecnico di Milano by Jesús Donaire García de Mora, Madrid, 2018

The School of Madrid is traditionally famous for its wide range of educational options in the design realm. Such options range from purely mathematical subjects to those related to construction and technology, and to the exploration of form and political speculation. In Milan, instead, the same variety has been recently achieved through an excellent policy in terms of visiting professors, which translated into a multiplication of educational options for its students. The School of Milan has managed to preserve 12 hours of weekly classes devoted to Design Workshops, while in Madrid, the launch of the 2010 Plan reduced those hours to six.

In both cases, the subject continues to claim a fundamental specific weight, and to be a discipline that represents and characterises these Schools. The *Degree Thesis* projects of the respective students still contribute to exhibitions organised outside the university, as exemplified by the exhibition *About Futures*, organised by Armani/Silos with the Politecnico di Milano, or by the yearly exhibition of end-of-studies projects organised by the official Association of Architects of Madrid.

The Armani/Silos exhibition presented models made by students, a practice that maintains its relevance in spite of the emergence of new technologies, and continues to be a fundamental tool for the development and learning of architecture students.

Indeed, not only does the model represent a useful tool for the study of volume and form – it is also a key means to explore the skeleton and envelope of a building or, in other words, the structure and construction of space. During my lessons at the Design Workshop at the two Schools, the model becomes a fundamental tool in combination with the graphic documents that help the student to find out about the issue he is most interested in. Our work starts from a preliminary, usually hand-sized model, and ends with a detailed model of the building. There are no constraints in the use of these tools in the classroom, so as not to hamper creativity and, instead, promote the exploration of new experimentation realms. The model is a very powerful visual tool that opens the eyes of both the author and the beholders. For this reason, our lessons are always collective, as in an artist's studio, so as to promote discussion on the issues that emerge during the course. Although students are aware of the commitment required by the amount of work these workshops imply, the results are guaranteed and ever since the early weeks, a healthy competition stimulates all the members of the group. Besides this work on models, our students are required to acquire a knowledge of architectural history, understood as a marriage of tradition and modernity. In this way, we prepare them to develop research and add a fundamental tool to their cultural background for their future creative work. Indeed, each course requires its students to develop a set of guided researches aimed at preparing a catalogue of references about architectural design – a catalogue that is open to consultation and whose chapters are illustrated in the classroom by the respective authors.

While these Schools already belong to a globalised world, their students naturally belong to a frontier-less world. The two Schools train architects who work in every corner of the planet at architectural firms and in other contexts related to their profession. The recent economic crisis has boosted this export of talents. However, far from having exclusively negative influences (such as the costs of an education that does not guarantee exclusive and direct benefits to one's country), this situation has generated a world full of professional opportunities for a generation that brings high-level education and professionalism everywhere.

Moreover, these young architects benefit from a myriad new learning opportunities, as well as from the possibility to contribute to highly complex projects they would be hardly able to approach in our countries. Such situation has led architects to stop

focusing on a local scene and to expand, instead, the boundaries of their activity.

The result is the emergence of professional relationships that open the door to ambitious projects that would have been hardly imaginable before the crisis. This “post-crisis” social situation defines an idea of architecture as cooperative work, in which the poetry of architecture hides behind a set of complex technical tools that allow for the achievement of architectural projects in the respect of the current requirements of the market.

Besides the young professionals, the crisis has also affected the professors who are increasingly invited to teach at Schools of architecture in countries like the United States or Canada that traditionally prize highly qualified professionals, as well as and particularly in regions like China, the Arab countries and the emerging countries of Latin America. Finally, these transformations also affect teachers who, like me, are lucky enough to work in Schools that follow internationalisation policies.

We are facing a complicated global scene. However, the passion that invests every facet of architecture is still there, for both professors and students. The problem appears increasingly complex but the tools and technologies at our disposal equally become increasingly sophisticated, in a way that facilitates their solution.

Precisely as illustrated by the words of Steven Holl quoted at the beginning, we are all students who are keen on facing the future by surveying increasingly hybrid and interesting spaces and by shaping increasingly sustainable and environment-friendly cities. Therefore, our task is, starting from our two Schools, AUIC and ETSAM, important points of reference in the world scene, keeping on motivating and adequately training the future professionals of architecture so that all of this becomes a reality.

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# THE ARCHITETTURA E DISEGNO URBANO STUDY PROGRAMME AT THE POLITECNICO DI MILANO

Francesca Bonfante

**A**re the teaching methods and relationships between theory and practice questionable today? Such question arises spontaneously in an age when the city, with the architecture that fundamentally constitutes it, seems to have entered a sphere that escapes any judgment and distinction – an age characterised, to paraphrase Lyotard, by the decline of “grand narratives” when any foundational notion of city seems to have become impossible.

Terms originally referred to the economic context such as “mondialisation” and “globalisation”, later extended to the information, communication and cultural industry technologies, to embrace finally the very idea of city, often imply that it is no longer necessary to question their meaning. Indeed, the argument of the emergence of a “world culture” seems to be very controversial, as demonstrated by several famous books that present even distant points of view<sup>1</sup>. The current situation of economic, energy, overpopulation and ecological debt crisis, the effects of which reverberate not only on the chaotic development of world megalopolises but even on the suburbs and metropolitan conurbations of “developed” countries, calls for a deep meditation about the role of cities and the adequateness of the current regulations in terms of architectural design and urban planning.

## The aporia of the School of Milan

An interpretive hypothesis suggests that in Milan the role of the School of Architecture in the context of the polytechnic culture<sup>2</sup> and of institutional design

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1. DAVIS Mike, *Il pianeta degli slum*, Feltrinelli, Milan, 2006; Koolhaas Rem, *Junkspace. Per un ripensamento radicale dello spazio urbano*, MASTRIGLI Gabriele (ed.), Quodlibet, Macerata, 2006.

2. The debate about the relationship between engineering and architectural disciplines in teaching and professional prac-

that supported it has always influenced the academic and professional trajectories in a way that triggered tensions and sometimes heated inner contrasts.

The foundation of the identity of the School of Milan relies, on one side, on a top-quality professional culture, which represents – perhaps in the past more than today – an enlightened bourgeoisie and an industrial *élite*, and, on the other side, on a deep belief in the central role of teaching as a practice that is fully entitled to address the transformation processes of the city.

The most meaningful heritage resulting from Rogers' lesson, beyond the obviously meaningful recognition of his work, is perhaps the equal dignity a holistic and experimental teaching claims towards prestigious professional practices. In Milan, teaching meant “creating architecture”; I believe that missing this point would mean missing the core of the discussion.

Almost a decade ago, in 2010, the “School of Milan”<sup>3</sup> was the subject of two books<sup>3</sup> written by Antonio Monestiroli and Guido Canella<sup>4</sup>.

About the contradiction between complexity and simplification within the twentieth century theoretical debate<sup>5</sup>, Monestiroli wondered why contemporary

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tice has a long tradition. Here, we will only refer to some essays by Camillo Boito: *L'architettura odierna e l'insegnamento di essa. Parte seconda*, in “Il Giornale dell'ingegnere, architetto e agronomo”, November 1860, pp. 380-396; *L'architettura odierna e l'insegnamento di essa. Parte terza*, in “Il Giornale dell'ingegnere, architetto e agronomo”, November 1860, pp. 579-591; *Insegnamento e professione*, in “Questioni pratiche di Belle Arti”, Hoepli, Milan, 1893, pp. 353-369.

3. CANELLA Guido, *A proposito della Scuola di Milano*, Ulrico Hoepli, Milan, 2010; MONESTIROLI Antonio, *La ragione degli edifici. La Scuola di Milano e oltre*, Christian Marinotti, Milan, 2010.

4. The two authors were among the founders of the *Faculty of Civil Architecture* of the Politecnico di Milano, established in 1997, whose deans were Antonio Acuto (1997-2000), Antonio Monestiroli (2000-2008), Angelo Torricelli (2008-2015).

5. A contradiction, according to Monestiroli, that only the pursuit of the reason of buildings could solve. The same principle underlay the work of Albini, Gardella, Rogers, Asnago e Vender, Grassi, Rossi and, along with them, Libera,

architecture had forsaken any theory that could have shaped a new phase of modernity and found two main reasons for such attitude. «The first reason concerns a general transformation in the culture of the time. The age of industrial production, when the notion of construction had a deep, even epic, meaning of construction of the world, was followed by the age of communication and its inherent hegemony of images»<sup>6</sup>.

Architecture was equally reduced to pure image and design lost its central role of transformation of reality, stripped of the hope for a better world. «The second reason for the crisis of theory in the second half of the twentieth century, – Monestiroli continues – concerns the relationship between architecture and the city that, in the post-WW2 period, changed deeply. The relationship between buildings and contexts of the historical city underwent a radical change with the new dimension of settlements, the radical transformation of infrastructures, the new relationship between unbuilt spaces and built spaces that, as argued by Giuseppe Samonà, ceased to be a relationship between two recognisable entities, city and countryside, and became the superposition of realities that intersect and create an entirely new landscape in which architecture may play a crucial role»<sup>7</sup>. The followers of Rogers – Aldo Rossi, Guido Canella, Vittorio Gregotti, Giorgio Grassi in Milan; Gianugo Polesello and Luciano Semerani in Venice; Carlo Aymonino in Rome, among others – interpreted the relationship between architecture and the city in various formal ways in terms of poetics. However, all their approaches relied on one goal – knowing and practicing a critique of the reality of their time or, as György Lucaks would have said, practicing a “critical realism”<sup>8</sup>.

On his part, Canella, precisely in discussing the critical interpretation of the generation of followers, defined the different approaches to typology with reference to the city<sup>9</sup>: «Our convergent

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the Roman architect more similar to the Milan school who, along with others, established a recognisable school of thought, the School of Milan.

6. MONESTIROLI Antonio, op. cit., p. 15.

7. Ivi, pp. 17-18.

8. LUCAKS György, *Il significato attuale del realismo critico*, Einaudi, Turin, 1957.

9. Canella's book, the result of the lesson held during the 2006-07 academic year within the *Theories of Architectural Design* course directed by Monestiroli himself at the *Facoltà di Architettura Civile* [Faculty of Civil Architecture], explores the forms of Italian and Milanese modern architecture through the generation of the “masters” and the generation of “Rogers’ followers” mentioned above. In this regard, Canella mentions two texts from the mid-1960s: Canella Guido, *Sulle trasformazioni tipologiche degli organismi architettonici (disegno di un trattato di architettura)*, lecture notes, Istituto di Composizione della *Facoltà di Architettura*



Bertolt Brecht,  
*Mutter Courage und  
ihre Kinder* (Mother  
Courage and Her  
Children), 1938-39:  
staged by  
Bertolt Brecht at the  
Kammerspiele of  
Munich, 1950.

interest in the enhancement of the typological analysis aimed at the critical review of the experience of the Modern Movement, although it was morally legitimised as an avant-garde resulting from a sudden state of necessity triggered by either aesthetic, sociological, economic, technical, functionalist reasons. We countered such interpretation with the enduring meaning of architecture in the transformation of the city. However, ours were two different critical interpretations of the concept of typology: while the interpretation proposed by Aymonino and Rossi was

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del Politecnico di Milano, Milan, 1965, the result of a research conducted by Canella and funded by the *Ministero della Pubblica Istruzione* [Ministry of Public Education] in 1964; Aa. Vv, *Aspetti e problemi della tipologia edilizia. Documenti del corso di Caratteri distributivi degli edifici*, Cluva, Venice, 1964, a collection of lessons held by Aymonino and Rossi at the IUAV in 1963-64.

constatational and taxonomic, my interpretation aimed at a propulsive role through its active use of structural transformation and representational architecture in the context»<sup>10</sup>.

In this sense, I think I can argue that the key assumption of the School of Milan is the argument about the “structure” of the city, a work that fully encapsulates the theoretical tension of the different protagonists, both in terms of the clear material and formal implications, and of its epistemological potential. Within such frame, two lines can be recognised by following the cues of the two books mentioned above<sup>11</sup>. One is more inclined to a rational explanation of the architectural practice, to a preemptory definition of architecture as an essence made of stable, absolute and unchanging facts in time, where the city is a collective production of which architecture represents a subjective and at the same time collective manifestation. The other, beyond any descriptive classification of urban phenomena, rather aims at identifying in the *forma urbis* the manifestation of structural factors, and in the typo-morphological device the design synthesis of even discontinuous urban facts in space and in time. An actual “spatial device”, variable and original with respect to the conditions of the context, understood as the historical development of a landscape in a structural and anthropological sense<sup>12</sup>.

Precisely in Milan, today we may perhaps recognise some positive signs of the debate about the contemporary city, finally immune to the “war of neologisms” of recent years, provided we are able to overcome the historical contradiction between “critical realism” and “false conscience” of the disciplinary and academic culture<sup>13</sup>.

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10. CANELLA Guido, *A proposito della Scuola di Milano*, Ulrico Hoepli, Milan, pp. 76-77.

11. The heritage of the first generation was later expanded in several directions according to a complex geography that ranges from Sergio Crotti's morphological researches to Enrico Bordogna's typological-figurative researches.

12. A conceptual and methodological approach with deep roots in the Milanese architectural and urban planning culture between the two wars, in particular in the often-ignored studies and proposals presented by Giuseppe De Finetti and inspired by an inherent inclination to realism. De Finetti explores the city starting from its historical, physical and structural individuality and reaches different design hypotheses based on the themes and scales of intervention, where layouts and figures are subject to a higher order induced by the very breath of the city. A special approach that carries theory into practice.

13. About the contemporary city, see the PRIN research conducted by Alessandro Balducci *Territori post-metropolitani come forme urbane emergenti*, 2012-16 and AA. VV., *Oltre la Metropoli. L'urbanizzazione regionale in Italia*, BALDUCCI Alessandro, FEDELI Valeria, CURCI Francesco (eds.), Guerini e Associati, Milan, 2017. About the contradictions between “reality” and “ideology”, instead, see VERCELLONI Virgilio, *Dal Piano del '53 al Piano Intercomunale*, in “Casabella”, 451-452, October-November 1979, pp. 52-55: «The relationship between

Forty years ago, Fernand Braudel warned about the forecasts about the future and a “catastrophist” vision of the present: «As a matter of fact, man changes pace. Civilization, all civilizations, all our material, spiritual, intellectual activities are affected by such change. [...] The present cannot be a boundary, which all centuries, heavy with eternal tragedy, see before them as an obstacle, but which the hope of man, ever since man has been, has succeeded in overcoming»<sup>14</sup>.

For this reason, we wonder, with the eye of Europe and the Italy of one hundred cities, whether a notion of “destructured” physical environment may be opposed to that of the “culture of the city”, a major achievement of late twentieth century Italian architecture, thereby implementing alternative growth models in order to reclaim active or “missing” resources.

### **The institutional frame: designing or teaching**

We discussed the relationship between architecture and the city during the process that led to the definition of the educational content of the *Architettura e Disegno Urbano* [Architecture and Urban Design] programme, the result of a complicated reorganisation of the Master’s Degree Programmes in Architecture within the Politecnico, promoted in 2013 by a Committee established by the da Academic Senate. Such process was part of a wider institutional frame and articulated in some fundamental steps I will try to resume briefly.

Clearly, this is not the appropriate place to take stock or make assessments about the relationships between University policies and the issues of the Schools of Architecture. However, now (March 2019) that the gates of what once was the *Scuola di Architettura Civile* [School of Civil Architecture] in the Bovisa district (via Candiani) have luckily reopened and students are back, it seems legitimate to have some afterthoughts about the reasons and the *ratio* of that process.

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“anthropic geography” (which is approach and analysis starting from the structural phenomena that produce it, and from the “specific laws” that guide its development process) and “urban planning” was in our country, in particular in those years, but even today, an irredeemable dichotomy between “reality” and “ideology”, certainly to be understood as “false conscience”, presented by the parties as a conflict between “trivial pragmatism” and “urban planning culture”; text quoted and contextualised in ACUTO Federico, *Lucio Stellerio d’Angiolini. Un’altra prassi urbanistica. Scritti 1956-1955*, Maggioli, Santarcangelo di Romagna, 2012.

14. BRAUDEL Fernand, *Scritti sulla storia* (1969), Bompiani, Milan, 2001, pp. 265-268; eng. ed. *On History*, The University of Chicago Press, Chicago 1980, p. 271.

So, the first step was the unification, in the 2014-15 academic year, of the *Scienze dell'Architettura* [Architectural Sciences], *Architettura Ambientale* [Environmental Architecture], *Architettura delle Costruzioni* [Building Architecture], *Progettazione Architettonica* [Architectural Design] programmes (class L17), at the time offered by the Politecnico through its *Scuola di Architettura e Società* [School of Architecture and Society] (for the first two programmes), and its *Scuola di Architettura Civile* [School of Civil Architecture] (for the second two programmes) into one *Progettazione dell'Architettura* [Architectural Design] programme.

The educational project aimed at establishing a programme based on design and at preserving the yearly *Architectural Design Workshops* for the first two years<sup>15</sup>. Such workshops were understood, as Angelo Torricelli underlines, as meeting spaces that «represent, in recent times, the most relevant contribution to the definition of educational facilities adequate to the education of future architects»<sup>16</sup>.

The second step was the establishment of the new *Scuola di Architettura Urbanistica Ingegneria delle Costruzioni* [School of Architecture Urban Planning Construction Engineering] (AUIC) in January 2016, as the result of the unification of the Schools of *Architettura e Società*, *Architettura Civile*, *Ingegneria Edile-Architettura*.

The cultural project of the School anticipated the issues and the problematic realms to be explored in the articulation of the reformed educational projects of Master's Degree Programmes and of refinement and review of the content and goals and of the Bachelor's Degree Programmes. It also underlined «the need to candidate the School to become the point of reference of a process of deep change that requires important contributions both on the level of innovative processes capable of restoring competitiveness, and of defining a turning point in the quality of future habitat»<sup>17</sup>.

The third step was the reform of the class LM4 Master's Degree Programmes according to some fundamental goals – defining a clear educational offer characterised and free from

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15. It is worth mentioning that not everyone agreed with the educational project; a central issue was the half-yearly or yearly duration of Workshops.

16. TORRICELLI Angelo, *Architetto chiamerò colui...*, in "Architettura Civile", 11/12/13, 2015, p. 2.

17. Scuola AUIC, *Progetto culturale e didattico*, 2015.

superpositions; placing the offer with reference to the Italian and international contexts; establishing a closer relationship with the *Progettazione dell'Architettura* [Architectural Design] Bachelor's Degree Programme; detailing the theme characters with reference to departmental researches; achieving a stronger international character<sup>18</sup>.

It was decided to reorganise, in the Milan seat, two Programmes with the same number of students (440 between Italian and international students), with a six-month educational structure – which raised some controversy. One was called *Architettura – Ambiente Costruito – Interni* [Architecture – Built Environment – Interiors], the other was called *Architettura e Disegno Urbano* [Architecture and Urban Design].

The two reformed study programmes shared the policy of avoiding a fragmented offer, and rather opted for the activation of only two PSPAs, with similar paths in Italian and in English. The first year offered the same programme to all the students, while the second year offered thematic and final workshops aimed at exploring specific design issues also in view of the Degree Thesis.

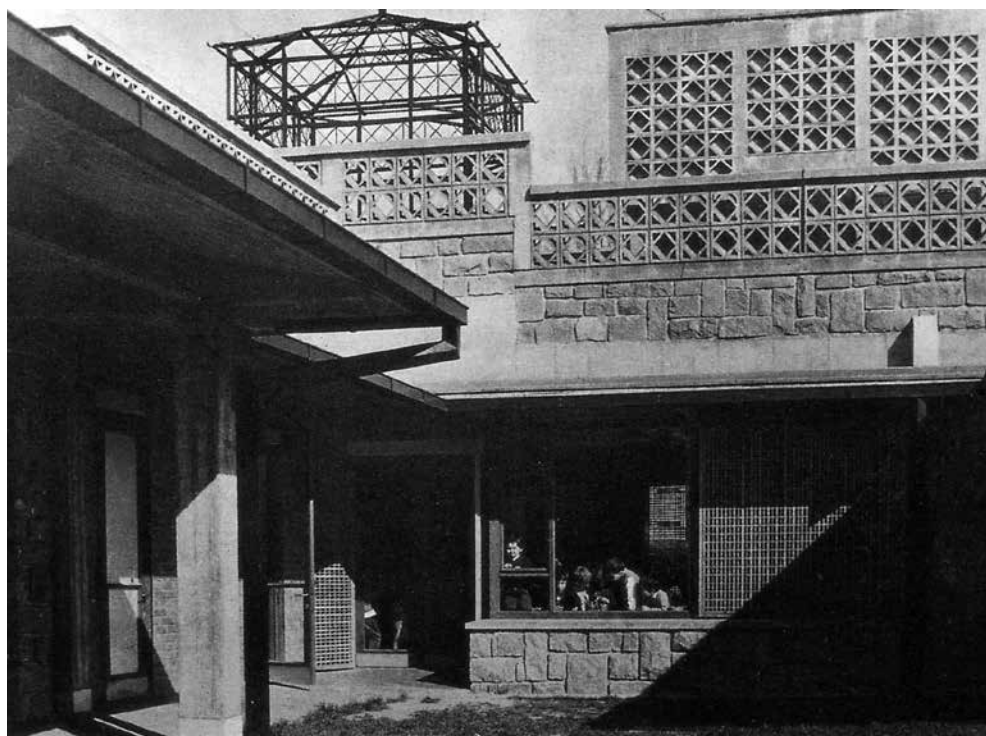
In the case of *Architettura e Disegno Urbano* [Architecture and Urban Design], the goal was and is pursuing some key goals – multi-disciplinary education, experimental approach, critique workshop.

“Multi-disciplinary education” reflects the need to combine the contributions from the Italian design, theoretical, humanistic and artistic tradition with the changes and contaminations of home-living cultures, the forms and spaces of the contemporary city, the settlement phenomena of emerging countries, constructional innovation and environmental sustainability. In other words, training a cultivated architect who is aware and capable of combining knowledge with practical skills and of achieving design syntheses at the various scales with the contribution of a multiplicity of notions and techniques. In this frame, different realms are required to take responsibility with reference to

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18. The two *Architectural Design and History* and *Sustainable Architecture and Landscape Design* programmes, established in the 2015-16 academic year, were confirmed in Mantua and Piacenza; the *Architettura delle Costruzioni* [Building Architecture] programme was confirmed with slight variations in Milan, while it was considered that it was necessary to reorganise the *Architettura* [Architecture] and *Architettura-Progettazione Architetonica* [Architecture-Architectural Design] Programmes, respectively available at the *Scuola di Architettura e Società* [School of Architecture and Society] and at the *Scuola di Architettura Civile* [School of Civil Architecture].





Mario Ridolfi,  
Wolfgang Frankl,  
Olivetti Kindergarten  
in Canton Vesco,  
Ivrea, 1955-63.

design's fundamental choices and to prepare the students to recompose their different educational experiences in a unified frame in a way that does not express a univocal cultural point of view but highlights their specificity with respect to overall education, as university education is expected to do.

The “experimental approach” is understood as the interweaving of different forms of knowledge and disciplines, between research and teaching, in the dialogue on a common ground – the transformation of physical environment.

The “critique workshop” is the place where experiments and critique are developed jointly by teachers and students, according to the best tradition of Schools of Architecture. The issue of the transformation of physical environment was considered as a key discriminating element for the critical interpretation of the city and its future development – a concrete, sometimes “invisible” palimpsest that reveals tensions and conflicts, permanent and changing elements.

The 2018-19 academic years marked the conclusion of the first two-year programme in its renewed organisation and the first Degree Thesis were presented in July. Therefore, it will be

necessary to assess to what extent the initial resolutions have been actually achieved.

### **An open conclusion: an old issue and some keywords**

I rely once more on the words of a master, Le Corbusier, who said about teaching architecture, «I would strive to inculcate in my pupils a keen sense of control, of unbiased judgement of the “how?” and “why”... I would encourage them to cultivate this sense till their dying day. But I would want them to base it on an objective series of facts. Facts are fluid and changeable, especially nowadays, so I would teach them to distrust formulae and would impress on them that everything is relative. [...] Now that I have appealed to your sense of honesty, I should like to inculcate in you, and in all students of architecture, a hatred of “drawing-board stylism”, which is merely covering a sheet of paper with alluring pictures, “styles”, or “orders” – these are fashions. But architecture is space, breadth, depth, and height, volume and circulation. Architecture is conception of the mind. It must be conceived in your head, with your eyes shut. Only in this way can you really visualise your design»<sup>19</sup>.

Do we still believe in that?

If you learn architecture from architecture, and you learn the city from the city, rather than from the accretion of technical and regulatory notions, the main goals we should pursue in teaching should be education to a careful training of the eye and of judgement, refinement of the critical skills in order to decipher the complexity of reality and recognise quality in the huge amount of contemporary production. And again, if the problem of the transformation of physical environment can be an essential discriminating element for the critical interpretation of the city, how can we conceive its relationship with architectural design and its teaching? Is it still possible to rely on the masters of late twentieth century Italian architecture?

*Presentifying and making reality.* In 1961, Rogers wrote, «Architecture is conceptually a synonym of life, and not just of the life we experience, but of the life that testifies to our passage among the present and future beings. Making an architecture means “presentifying” the past and “futuring” the present. Whoever fails to grasp such fundamental principles, should

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19. LE CORBUSIER, *If I had to teach architecture? Rather an awkward question...*, in “Focus”, 1, 1938, now in “Casabella”, 766, May 2008, pp. 6-7.

neither be an architect nor teach others to become one»<sup>20</sup>.

*Taste and formal expression.* When he presented the programme for a course about the *Characters of buildings*, Ludovico Quaroni mentioned «a history of taste, conducted on a scientific level, by considering taste as the formal expression of a society, in other words by considering form not in itself but as the result of a culture, a technique, a psychology, etc. [...] by considering function as not limited to the material requirements of the organisation of environments and services, but extended to the structure and fulfilment of all the psychological and spiritual needs, and by considering aesthetics as the result of a particular way of solving the problems of function»<sup>21</sup>.

*Theatricality and figuration.* Bruno Zevi tellingly entitled his review of the kindergarten built by Mario Ridolfi for Olivetti in Canton Vesco for “L’Espresso” magazine, *Mario Ridolfi in Ivrea. A green stage for children*<sup>22</sup>. This work, a cheerful celebration of child life, can be taken as an example of a way of expressing a figurative quality both inside and outside a design, in a way that epically interprets the destination and the programme of behaviours, participates with its independence in the surrounding diorama, and bestows an unexpected theatricality upon the landscape<sup>23</sup>.

*Estrangement and transformation.* On the other hand, Bertolt Brecht, with the use of *Verfremdung* (estrangement) in his epic theatre – most clearly in *Mother Courage and Her Children*<sup>24</sup> – adopts an overtly “political” scenic practice in order to restore the pedagogic function of theatre (for example expressed by religious theatre) and encourage the spectator to use rationality rather than pure emotion, in order to understand that human condition can, and should, be transformed<sup>25</sup>.

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20. ROGERS Ernesto Nathan, *Architettura assurda*, in “Casabella-Continuità”, 257, November 1961, p. 1.

21. QUARONI Ludovico, *Caratteri degli edifici*, in “Metron”, July-August 1947, pp. 25-34.

22. Zevi Bruno, *Mario Ridolfi a Ivrea. Un palcoscenico verde per l’infanzia*, in “L’Espresso”, 21 August 1966, now in Zevi Bruno, *Neorealismo a Ivrea razionale* in “Cronache di architettura”, vol. VI, Laterza, Bari, 1970, pp. 271-274.

23. About the relationship between theatricality and figuration, a constant concern of my educational and research activity, see BONFANTE Francesca, *Teatralità e figurazione per la città. Scritti sul progetto e l’insegnamento dell’architettura*, Il Poligrafo, Padua, 2015.

24. BRECHT Bertolt, *Mutter Courage und ihre Kinder*, 1939, staged for the first time in Zurich in 1941.

25. The estrangement method was adopted by Viktor Sklovskij in his *Marco Polo*; in retracing the extraordinary adventures of *Il Milione*, in order to reveal new and unusual aspects of reality, Sklovskij relies on an imagination activity that can transpose the object from its usual

Transforming the physical environment through design, practicing a critical-operational activity, imagining (a piece?) of the future city, expressing taste and character – I think these are the tasks of our teaching activity.

However, I wonder how – within the array of tools, methods, languages provided by a Study Programme/educational and scientific community – a student may find his own “red thread”, his own way of developing a critical skill, achieving a responsible act, choosing his own references<sup>26</sup>.

There is certainly a dichotomy between what students learn from the most significant examples of the past centuries, of the Modern Movement and of contemporary architecture, and the contradictory landscape of the current city. On the other hand, the wide availability and the often acritical use of digital platforms make it difficult for them to imagine the construction of a different city without taking refuge in the pure world of image. They need to learn to analyse, compare, recognise. Only then, can the student express, through design, his own not impromptu voice and the new generations may constitute a new force of transformation.

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perception to the sphere of new perception, by using image not to make its meaning more understandable but to create a particular perception of the object, its “vision” rather than its “recognition”. SKLOVSKIJ Viktor (1936), *Marco Polo*, Il Saggiatore, Milan, 1972.

26. About the question of references, see BONFANTE Francesca, *Progettare con i riferimenti*, in Aa. Vv., *Atlante di progettazione architettonica*, PALMA Riccardo, RAVAGNATI Carlo (eds.), Città Studi Edizioni, Novara, 2014, pp. 268-283. The book presents the contributions of architectural design professors from different Italian universities about four issues: Designing with texts, Designing with places, Designing with references, Designing and composing.

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## TEACHING ARCHITECTURE, EDUCATING TO DESIGN

Andrea Campioli

The issue of “teaching architecture” evokes a debate that grew particularly heated in Italy in 1990, in coincidence with the review of regulations for architectural education resulting from the enactment of D.M. 509<sup>1</sup>. In particular, I remember the initiative undertaken by Renato De Fusco, who published a series of pieces in his magazine “Op.Cit.” in order to illustrate the complicated scenario within which art teaching would have to be placed. One of these pieces, written by Giancarlo Carnevale, had the title *L'architettura non si insegna, si impara*. I still agree with many of the things Carnevale wrote in his article that supports the reasons of a basic difficulty in formalising the practices of architectural teaching. They would result from the fact that «in design, the “solutions” are never implicit in the “programme”, but emerge with difficulty and gradually from the atmosphere of entropy that characterises any initial phase of design»<sup>2</sup>. However, I disagree with the assumption expressed by the title of the piece that peremptorily argues for the impossibility of teaching architecture.

The abundant literature about this issue, the existence of scientific institutions and of meetings that specifically and systematically deal with the issue of architectural education dampen the ineluctability of the argument expressed by the title of Carnevale’s article.

Indeed, the problem lies not so much in questioning the possibility of teaching architecture as in understanding how to build, particularly in the current social-economic context, educational programmes that may provide the architects-to-be with the cultural sensibility and the skills required by the role architecture is called to play within society.

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1. D.M. November 3, 1999, n. 509, *Regolamento recante norme concernenti l'autonomia didattica degli atenei*.

2. CARNEVALE Giancarlo, *L'architettura non si insegna si impara*, in “Op.Cit.”, 78, May 1990, pp. 5-16.

In order to do this, I propose, first of all, a redefinition of the terms of the question, as I think that the phrase “educating to design” is better suited than “teaching architecture” to the epistemological and pedagogical specificity of architectural education.

### **Educating to design**

In the transition from teaching architecture to educating to design, a first shift concerns the verb.

“Teaching” evokes the action of whoever, «with words, explanations and even just with the example, encourages others to acquire one or more notions, an experience, a habit, the ability to perform an operation, or to learn to practice a job, or an activity»<sup>3</sup>. The fact that whoever teaches is required to “imprint signs in the mind” evokes a sort of passive attitude in whomever is required to learn that does not reflect the dialectic nature of learning in the architectural realm. Therefore, “educating” seems quite more adequate to express the maieutic effort of «promoting the development of intellectual, aesthetic faculties, and of the moral qualities of an individual» and of «developing and refining the attitudes and sensibility (either in an absolute way or by guiding them towards a specific goal)»<sup>4</sup>. Educating implies a full commitment in both the teacher and the learner and therefore the pedagogical style of educational programmes in the architectural realms, also due to the social role the architect is required to play, can only be that of educating.

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3. DURO Aldo, *Insegnare*, in “Vocabolario della lingua italiana”, Istituto della Enciclopedia Italiana fondata da Giovanni Treccani, Milan, 1987, vol. II, p. 894.

4. Ivi p. 219.



Atelier 35, rue de Sèvres 35, Paris, in a photo by Willy Rizzo, 1957.

The second shift concerns the object: architecture.

There are countless interpretations for the word architecture: some are exclusivist, and as such only consider as architecture the objects with artistic goals, while others are inclusivist and consider as architecture even the engineering objects that, even only incidentally, acquire an aesthetic character<sup>5</sup>.

These two different positions in the educational context result in two equally opposing syndromes. Whenever architecture is considered as a purely artistic expression, one tends to argue for the inexpressibility of the design action, while, whenever the term architecture embraces the entirety of processes that transform the built environment, one emphasises the operational aspects. Focusing on “design” as the object of education means overcoming this opposition.

Indeed, design, or better the design activity, may be considered as the ground for dialogue between the sense of “possibility” and the sense of “reality”<sup>6</sup>, in a way that places an idea of future at the centre of the theoretical meditation and pragmatic

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5. A wide-ranging treatment of the term architecture is available in FISHER Saul, *Philosophy of Architecture*, in ZALTA Edward N., *The Stanford Encyclopedia of Philosophy*, Stanford University, Winter 2016.

6. TAGLIAGAMBE Silvano, *L'albero flessibile. La cultura della progettualità*, Masson-Dunod, Milan, 1997.

action. Design emerges as a practice that relies on technical skill as well as on cultural awareness, understood as the ability to place design activity in a precise social, economic, productive context of reference. Given the increasingly strong tendency toward specialisation, design operates within a wide perspective of critical dialogue with the pressing requirements of society, the influence of economy, the reasons of production. This is precisely the frame of reference we should adopt when thinking about the education of architects.

### **The context of design**

Today, the professional figures involved in the processes of transformation of the built environment are required to make an extraordinary modernisation effort in order to provide an adequate response to the issues that are emerging with a certain urgency. Energy efficiency, environmental sustainability, new technological frontiers for the 4.0 industry are just some of the issues that are radically changing the scenario of reference of architectural design.

The reorganisation of the issues architectural design is currently required to address and the relative redefinition of the skills and roles of designers are accompanied by a process of transformation that affects the very organisation of design services. Even in Italy, there are now several organisational models besides traditional architectural firms that require new skills and abilities as well as new forms of knowledge. Professional firms often turn into increasingly larger design companies with a larger range of skills, their goal being providing a design service adequate to the economic relevance and to the complexity of issues they are required to address, so that they may compete also at an international level.

Focusing on the professional profiles properly connected to the design activity, one observes how, even considering the limited realm of the Italian situation, the scenario is rapidly changing. Nowadays, there are extremely diversified job opportunities both in terms of the size of design firms, and in terms of the specific positions designers are required to fill in those facilities. Even though a survey conducted in 2014 in Europe by the *Architect's Council of Europe*<sup>7</sup> reflects a situation where 74% of

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7. ARCHITECT'S COUNCIL OF EUROPE, MIRZA & NACEY RESEARCH, *The Architectural Profession in Europe 2014*, Mirza & Nacey Research, Arundel, 2015.



almost 600,000 architects are involved in an individual kind of professional activity, the situation seems to veer towards increasingly ramified and complex facilities.

Rather than a transformation of the professional profile of the architect, there seems to be a multiplication of roles, both in terms of the object of design activity, and in terms of the skills required to perform such activity.

### **The training of the architect**

From the point of view of training, we should talk about “architectural design graduate” rather than “architect”.

Given the contexts this individual is required to address, the architectural design graduate is required to systematise the complex problematic frame that characterises the processes of transformation of the built environment. At the same time, this subject proactively contributes to articulated design facilities within which the complexity of problems is addressed through the convergence of different specialised contributions. Moreover, the architectural design graduate operates within radical and deep transformative dynamics and, at the same time – in Italy, during the next few years, most probably as a primary activity – is involved in a painstaking action of conservation, enhancement and rehabilitation of the widespread built heritage.

Given such situation, in developing educational programmes in the architectural realm, we should pursue the goal of providing students the opportunity to acquire design abilities, knowledge and skills required to address increasingly complex processes with a cross-disciplinary approach rather than trying to keep pace with a hardly definable job market.

The question is not recognising possible specialisations in view of diversified job opportunities but rather strengthening abilities and skills applicable to different job contexts.

If this is the perspective we are facing, then we should make an effort to find the adequate contents and pedagogic organisation for the training of an architectural design graduate who may respond successfully to a professional practice with increasingly blurry and expanded boundaries.

### **Inter-disciplinarity vs specialisation**

Even within architectural design, some specialisation areas seem to emerge today that characterise the main engines of innovation.

The increasing centrality of issues such as the containment of energy consumption or environmental sustainability urgently requires architectural design to confront new problems. It is necessary to define new spheres of competence and new levels of transversality in the exploration of aspects traditionally addressed through a merely engineering logic.

In certain ways, the attitude to develop design with a spirit of disciplinary openness places the architecture graduate a step ahead of professionals trained in other educational contexts. Therefore, we should understand at what point of the process of learning and in what way we should possibly intervene in order to improve and intensify the exploration of specialised skills without compromising the ability to address problems with the wide-ranging and transversal perspective required by design education.

Degree Programmes should rely on a cross-, inter- and trans-disciplinary education, while any specialisation programme should be activated within third-level education through university master programmes devoted to specific issues and training programmes characterised by a high integration between university and subjects operating outside the university. One reason for such approach is also the fact that in the near future professional competitiveness will increasingly rely on continuous qualified training processes.

Within such scenario characterised by a widespread multi-disciplinarity, the role of the architect shows clear elements of weakness.

The necessary reference within design to competence realms characterised by strong disciplinary foundations, such as engineering or the environmental sciences, threatens the architecture graduate with the risk of finding himself in the uncomfortable position of a mere consumer of knowledge. The only way to avert such danger is by developing educational programmes that allow the student to become aware of his role as a producer of knowledge, so that he will be able to play his traditional role as an active intellectual – a role that nowadays seems to be replaced by a mere operational status. Particularly at the beginning of the educational path, this implies a rethinking of the relationship between “teaching design” and “teaching for design”, through the pursuit of a balanced relationship between experiences that allow students to develop the skills required by design practice and experiences specifically aimed at the development of forms of knowledge and critical awareness typically associated with the role of the architect.

### Teaching design and teaching for design

The two teaching approaches that prevail in the educational programmes within Italian Schools of Architecture are workshops, organised in design exercises and lessons focused on the proposed design activities, and courses, organised in lessons and seminars. Within workshops, students acquire the methods and instruments required to develop a project (teaching design) by drawing on the contents of the different disciplines that relate to the design experience. Within courses, students acquire, instead, the notions concerning the different disciplinary realms that constitute the essential background of the design activity (teaching for design), ranging from the historical disciplines to the physical-technical and plant engineering disciplines, from the disciplines for architectural and urban design to the structural disciplines, from the disciplines of representation to the technological disciplines for architecture and building production, from estimate disciplines to the disciplines for territorial planning.

These teaching approaches have been experimented for a long time and show some critical aspects that should be addressed swiftly.

On one side, there are the workshops that, while representing the learning experience closest to the actual world of professional practice, often require students to address purely hypothetical design themes. Within workshops, the design experience often amounts to an abstract simulation characterised by a marked simplification particularly with reference to the absence of an actual dialogue with operators working within real decision processes and to the indeterminacy of the regulatory frame of reference. Workshops cannot be considered as places where students merely test their abilities with reference to the theme proposed by the professor. Instead, they should represent an opportunity for actual experimentation where the student has a chance to understand the different variables that affect real situations. In this way, the workshop becomes an opportunity to bridge the gap that sometimes separates the university and production worlds and, at the same time, to experiment a methodology that links the epistemological, disciplinary and academic boundaries of the design activity and combines scientific rigour with innovation and intuition<sup>8</sup>.

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8. CHARALAMBOUS Nadia, CHRISTOU Natasa, *Re-adjusting the objectives of Architectural Education*, in "Procedia - Social and Behavioral Sciences", 228, 2016, pp. 375-382.



Foster and Partners  
office, Riverside, 22  
Hester Road, London.

On the other side, there are the courses, disciplinarily confined according to a vision of knowledge that appears increasingly inadequate to the complexity of the issues at stake.

In this case too, a necessary rethinking should highlight the requirement for a learning experience in which the student has a chance to get in touch with the forms of knowledge that intersect the traditional perimeters of disciplines regardless of such boundaries. The forms of knowledge concerning the definition of highly comfortable environments, the involvement of subjects interested in the actions of design and planning of the decision process, the protection, conservation and enhancement of the

historical-cultural heritage, the management of the dynamics of transformation of the natural heritage, the design of spaces for fragile population groups are only some of the grounds of dialogue for design for which strictly disciplinary approaches now seem all but inadequate. Therefore, the question is how to develop the educational experience starting from a pedagogy that prizes transversality over disciplinary rigour, experimentation over the passive learning of established notions, thereby opening to new connections with disciplinary realms traditionally considered as unrelated to the world of architecture. Knowledge should be seen as an opportunity for exploration rather than a body of notions to be acquired. In this perspective, the goal of education becomes teaching how to learn.

It becomes even clearer how all of this cannot be “taught” and, therefore, our effort as teachers should be aimed at “educating”.

Educating to a critical attitude, educating to the use of tools (investigative, problem-setting, problem-solving, technical, operational tools), educating to the passion for a job that is also a form of art, educating to the future.

In other words, educating to design.

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## TEACHING DESIGN: TRAINING, THEORY AND RESEARCH

Gennaro Postiglione, Alessandro Rocca

**A** Master's Degree is an educational programme basically founded on the integration of two training goals. One is the completion and enhancement of the basic knowledge acquired during the Bachelor's Degree. Indeed, we should not forget that the programme targets architecture graduate students and that a graduate in other, albeit related, disciplines is hardly likely to possess an adequate technical and cultural background. In fact, the Programme requires that all the basic competences – and here we mainly refer to design tools – are in place and available in order to address more complex issues with an increasing level of cultural and technical awareness.

Such goal is basically the full command of design skills and, therefore, preparing the student to enter the labour market. On the other hand, although we consider the professional practice of architectural design as the preferential achievement for our students, the Programme should not address professional requirements exclusively and additionally develop a dialectic relationship with the labour market even by accepting conflicts and differing views. The labour market has its own logics and rules – it also relies on field-proven expertise and develops its own top-quality standards and all those clichés, beliefs, habits, fetishes and simplifications that are required for the construction of an understandable and socially shared cultural palimpsest. The cultural background offered in an academic context should undoubtedly address the requirements of the market but, at the same time, develop renewed professional profiles equipped with the skills and sensibility required by the changes and challenges of our time and, if possible, even prepared to address the unknown factors of the near future.

In this sense, – this is the second goal – master-level university teaching should propose, in terms of design tools and goals, a new, avant-garde experience based on

experimentation, meditation and theoretical and practical critique. In other words, the priority we pursue, through the structure and spirit of the Programme, is the renewal of the architect's profile. An architect should be more than a responsible technical professional, and rather act as an intellectual who critically and creatively interprets the stimuli and constraints of the world he works in. This is a typical, as well as important and controversial heritage of Italian culture that, over the last decades, produced both a number of international-level personalities and sometimes fruitless and hopelessly marginal intellectualistic and academic deviations.

Therefore, our aspiration is preserving and updating the most positive aspects of such heritage, namely the tendency towards a complex and theoretically articulated approach to the design activity. In this way, we will be able to keep on exercising and producing a specific quality that is widely recognised abroad as a peculiar contribution and that we consider as a strategic asset of Italian university education that should keep on growing and developing.

Therefore, if the Bachelor's Degree addresses the grammar and syntax of architectural composition, the Master's Degree implies a further development of such skills and, at the same time, represents a fundamentally different phase when "research through design" comes into play. Indeed the dimension of research intervenes in the activity of the Design Workshop as an essential component of the learning-by-doing process.

Similarly, the typically professional dimension of problem-solving – understandably at the core of most design experiences during the Bachelor's Degree – is complemented by the questioning of problems, the unfolding and reformulation of programmes, the multi-scalar and multi-disciplinary reading of contexts, thereby making original choices, in a technical and culture sense, and by expressing consciously oriented points of view towards the complexity of reality.





*Architectural and  
Urban Design  
Workshop, Prof.  
Alessandro Rocca,  
AUIC School,  
Politecnico di Milano  
2019.*

The introduction of the “research” factor in certain ways also refers to our hybrid position compared to the educational systems adopted in other countries. For example, in the Anglo-Saxon world, there are two different types of Master’s Degrees – the *Master of Architecture*, which targets professional training, and the *Master of Science*, which focuses, instead, on the cultural and academic dimension. Following an established tradition in Italy, our Master’s Degree combines these two options and relies on the merging and mutual interaction of the cultural and professional orientations, with a coexistence that aims at training a

complete architect who can pursue a career in a range of different contexts or, even better, combine professional activity and study, research and theoretical and critical meditation.

The expansion of the design horizon, through the above-mentioned “research” approach, coincides with a phase in the career of the student of deeply changed environmental conditions. Indeed, attending a Programme with a remarkable percentage of foreign students and professors results in dialogues, frictions and conflicts among different cultures, among people who, while not always equipped and ready for mutual recognition, are required to learn such skills through a collective work. Although challenging, such experience inevitably results, for students and professors alike, in a remarkably improved ability to interact with everyone. The high rate of international subjects intervenes in a long-standing condition, for Italian and Milanese Schools of Architecture, of high attendance rates. In itself, the high number of registered and attending students – about 440 students attend our Programme only every year – defines some specific approaches for a teaching activity that cannot rely on a personal, close and deep dialogue between professors and students, and should instead count on shared and repeatable practices and, additionally, allow the student a relative operational autonomy. Therefore, this is a wide, dynamic and highly international and crowded community, with a constant turnover of students – this being a strictly two-year programme – and with a faculty equally constantly changing thanks to the remarkable presence of visiting and contract professors. A fascinating and stimulating, albeit challenging world that offers a multitude of alternatives and where the student is required to conceive and develop the entire curriculum, including the dissertation project, on his own. A further degree of freedom results from the relative independence of six-month terms, as it is possible to enroll in a Master’s Degree Programme either in September or in February – the two semesters are entirely equivalent and the sequences are not rigidly pre-established any longer. Therefore, the student is required to organise a logic relationship between the different educational experiences. Such modular organisation of relatively interchangeable semesters is equally justified in light of other considerations. One is the currently very high and constantly increasing mobility of students, both inbound and outbound. A second consideration is that continuity between Bachelor’s and Master’s Degree Programmes represents an increasingly less

significant element, both in terms of quantity, with the constant increase of students coming from other Italian and foreign universities, and in educational terms, due to the presence of programmes that, even in the Bachelor's Degree, become increasingly differentiated and subject to customisation.

The rapidly expanding range of Erasmus exchange programmes, both within and beyond Europe, and Double-Degree Programmes result in highly customised *curricula* that, from one semester to the next, may undergo unexpected changes of course due to the discovery of new themes, places and interests. Conversely, the remarkable presence of guest students, within six-month or annual exchange programmes, represents an element of marked unpredictability, especially in the case of workshops where students with highly differentiated profiles, attitudes, interests and design abilities share the same class.

In order to clarify the high level of customisation and the potentials of our *curriculum*, one should consider that a student attending our Master's Degree Programme, for example, has the opportunity to spend two semesters at a joint seat, attend a thematic workshop with a foreign visiting professor and prepare his dissertation abroad. Therefore, a student might theoretically go through the entire programme by attending only two workshops with our professors and only one semester in Milan. The same condition is observable in several other Schools in Europe, and highlights the profile of a new way of teaching (and learning) architecture. A less dogmatic and more open teaching approach, readier to capture the various opportunities for dialogue and interaction, and more trusting of the student's ability to choose and undertake initiatives, as he develops his own educational trajectory with his professors' help. In such context, the dialogue with different interlocutors becomes a very relevant element for growth. Besides the readiness to engage in an open dialogue, both professors and students are required to manage and solve conflictual situations that may question previously acquired knowledge, as well as – and this may be even more difficult – opinions, ideas, habits that belong to one's cultural and social identity.

Therefore, the legitimisation of teaching can no longer result from the repetition of shared models, the so-called “schools” or “cultural heritages”, however you may name them, which are only passed down and understood in a local context. Instead, it is necessary to establish flexible and changeable rules and commit to a work, shared in practice, that relies on the composition of

diversities and actively engaged in specific agreements, and pursue, every time, a balance among often shifting and unpredictable dynamics. In this situation, professors become cultural mediators rather than masters, and their main commitment lies in the preparation of a common ground, between professors and students, for the development of shared learning and knowledge processes, in order to express an equally free and aware design ability.

### **Educational goals**

The plurality of involved cultures, a characterising and enhancing feature of our Programme, finds an opportunity for assessment in the central role of the design activity conducted within the workshops that, through different themes and disciplines, promotes theoretical and practical research, teamwork, the refinement and development of compositional skills. For this reason, the Study Programme recognises a full design dimension to other disciplines besides Architecture – namely Restoration, Technology, Urban Planning and Interiors. This implies the definition of a multiplicity of professional profiles that successfully mediate between individual aspirations and requirements of the labour market that – it is worth emphasising – is unable to absorb the yearly flow of new graduates in our country. Indeed, in the European context, Italy is the country with the highest number of architecture graduates in the face of a weak and contradictory design culture. On one side, public competitions are rare occurrences, and on the other side, multiple professionals (from surveyors to civil engineers) effectively replace architects.

In such a difficult national scenario, the offer of an education organised into highly characterised thematic paths has become one of the main goals of our Programme that, starting with its very title, declares the range of its interests.

The title *Architettura – Ambiente Costruito – Interni* [Architecture – Built Environment – Interiors] clearly reflects the richness of perspectives and approaches to design, according to differentiated scales and focuses, which are practiced within the educational offer through a programme organised into monographic courses and disciplinary and thematic workshops that represent its main framework. Following such premises, the Programme, articulated into two symmetrical Study Plans, one in Italian (ACI: *Architettura – Ambiente Costruito – Interni*) and one in English (BEI: *Architecture – Built Environment – Interiors*), interprets architectural design with reference to some specific issues

related to the modification and regeneration of established urban and settlement fabrics, grafting and transformation, rehabilitation, restoration and enhancement of the existing heritage. The educational project focuses precisely on the European city as it has been developing over the last millennium, and has selected it as its prevailing operational horizon and as the privileged ground for the acquisition of a specific knowledge – architectural and urban design – applied through different disciplinary approaches.

Italian architectural culture views the city as an obligatory passage with relevant implications. Such choice is not merely dictated by the fact that the city, in our country more than in others, has always been the main theatre and workshop for every aspect of the civil life, from economy to politics. It also, and more importantly, represents a strong connection of continuity with late twentieth century theoretical elaborations, which, through the writings and designs of Saverio Muratori, Carlo Aymonino, Aldo Rossi and others, developed architectural thought according to the two closely interrelated parameters of building typology and urban morphology. As the heirs of such typically Italian and European tradition, we decided to preserve the idea that the relationship between the design of the architectural object and its context represents a key element, all while replacing the term city with that of “built environment”. This is a momentous phase for our culture that reflects deep changes in the actual territory, in the way it develops, is planned and built, and that intends to express a new approach based on strategies that are not necessarily resulting from the architecture/city dichotomy. Indeed, the built environment represents for us the existing architectural heritage, now subject to constant adaptations and transformations that, in the near future, will probably be affected in an even more significant form by requirements dictated by various kinds of issues, from energy and performance to the new concepts of domestic and production spaces. However, the built environment is also something else. It is the public space of historical centres and suburbs, to remain in the urban contest, as well as the neglected space of decommissioned industrial areas, infrastructures, tourist facilities and of the suburban condition, of the “rurban” that, as a new settlement model, mixes rural and urban features in wide sections of our territory.

The Programme anticipates some elements that characterise the professional practice, such as, for example, the cooperation within workshops among different disciplinary realms, in a way



that facilitates a synergy among research, education and issues expressed not only by local subjects. Work opportunities result from the intersection between the critical focus of the academic world and the requirements of stakeholders and various both public and private social players involved without the trivialisation of a mere question-and-answer dynamic.

At the same time, the hands-on approach and the fieldwork performed by several design workshops should be interpreted in a diametrically opposed direction, as places of study and discussion that enhance the understanding of reality by defining goals and experiencing trajectories without necessarily offering solutions. This is a specific declination of “research through design” that emphasises the definition and formulation of latent questions in the intervention contexts rather than the pursuit of answers. The “workshop” dimension, inspired by and interested in the complexity of real-life processes, justifies such articulation into different and complementary disciplinary modules by highlighting its strong methodological spirit, shifting the focus from the acquisition of specific forms of knowledge to the processes that underlie the design decisions, starting with the approaches that lead to the definition of the theme and of the very goals of the work.

### **Educational offer**

*Interior Design  
Workshop, Prof.  
Gennaro  
Postiglione, AUIC  
School, Politecnico di  
Milano 2019.  
Photo by  
Michele Nastasi.*

Design workshops are organised as semesters and understood as the main seats for the teaching of architecture.

They are part of all four study semesters and feature different thematic and disciplinary articulations, based on the assumption that students come from a solid three-year education path during which the foundations of design have been thoroughly addressed.

For this reason, the four workshops of the first two semesters feature an integration aimed at recognising some fundamental forms of cooperation within the professional practice (Architectural Design/Urban Planning, Technological Design/Technique of Constructions, Restoration/Drawing, Interiors/Plant Engineering).

Moreover, each workshop is responsible for the development of a project in relation with its disciplinary realm (architectural design, urban design, technological-environmental planning, restoration and interior design), in order to develop the educational offer according to a multiplicity of thematic and disciplinary approaches.

The third-semester workshops, instead, have a strictly thematic characterisation mainly developed by visiting professors – hired through an international call – so that all the students may benefit from an educational experience in an international context, which is considered as fundamental as any other educational elements within the Degree Programme. The five thematic workshops (Architecture, Interiors, Restoration, Technology, Urban Planning) – substitute to each other – represent the central core of the structure of the educational offer. Indeed, third-semester students are required to choose their course of study on their own by selecting the direction of their training in order to recognise a final profile that involves the issue closest to their interests.

Design work at the various scales, and according to the different foci, represents one of the most characterising elements of the Degree Programme, compared to the offer provided by other Architecture Master's Degree Programmes, both at the Politecnico di Milano and in the wider context of the national offer. Not only does it reflect the arguments provided in the introduction – it also offers multiple opportunities for experimentation and application of the disciplinary forms of knowledge of architectural design within diversified and challenging application contexts, rather than a mere academic exercise, although

this does not imply a belittling of the fundamental role of design meditation about architecture, which represents the central issue of research “through design”. In architecture, as in other art practices, one may argue that the advancement of practice almost exclusively relies on such operational approach, in a way that greatly reduces the prospective role of research “about” design, which is confined to dealing mainly with historical and critical issues. For this reason, one may also argue that research “through” design belongs to the realm of applied research, the domain in which one undertakes an original survey aimed at a practical result rather than only at the acquisition of new knowledge.

Such realm suffers from one of the most serious problems of the current educational offer resulting from an excessively rigid regulatory system. Indeed, it was not possible to create a second *Laboratorio Tematico Opzionale* [Architectural Design Workshop] alongside the *Laboratorio Progettazione Architettonica* [Architectural Design Workshop] that would have allowed students to acquire further skills in the wider realm of architectural design, thereby leaving thematic exploration as a further phase of educational refinement. In the next few years, we will assess the feasibility of such programme by pursuing the solutions to meet all the requirements and regulatory obligations.

Finally, during the last semester, the *Laboratorio Finale di Tesi* [Final Dissertation Workshop] offers a marked cross-disciplinary characterisation (three different disciplines concur to the configuration and development of the issue) in order to strengthen the connections among educational activity, research and professional situation, as we are aware that the freedom of university research represents a unique opportunity also to develop and address the actual problems the real world constantly presents. To this end, students will have no other educational commitment except for the curricular internship, which is almost a module of the final workshop. In this way, they will have an entire semester for the development of their dissertation under the guidance of a supervisor and at least two assistant supervisors. Indeed, the workshop itself has been conceived as a think-tank with the two-fold goal of presenting students with issues researched by some professors and of bringing academics and researchers with different disciplinary profiles to contribute to such issues in order to activate an actual research community through design.

In this case, there is still work to be done in order to achieve



the goals included in the structure of the study programme. At present, the missing elements include the facilities required to provide each workshop class with a classroom for every day of the semester, even though the transformations and expansions currently underway in the Leonardo campus bode well for a different situation in the near future when students are going to work in the classroom and be able to develop all the potentials contained in the educational form of design workshops.

### **A Community of Learners**

The goal of the Degree Programme is promoting the extended proximity between learners and teachers as a key element of learning and a distinctive feature of architecture studies.

Tacit knowledge – the set of disciplinary notions and forms of knowledge that are difficult to transfer by means of verbalisation and that recur in the design practice as a tool of formalisation – is developed and shared precisely through practice – a practice that is as necessary for students as for the involved teachers. For this reason, in line with the most advanced researches about architectural education, the structure of our Master's Degree promotes the establishment of a Community of Learners in which all the subjects are required to learn – both from each other and, more importantly, through the very practice of design that becomes, at the same time, means and goal of teaching architecture.

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# APPARATUS

## BIOGRAPHIES OF THE AUTHORS

**Jesús María Aparicio Guisado** (1960) graduated in Architecture and is full professor of Architectural Design at the *Escuela Técnica Superior de Arquitectura* (ETSAM) [Higher Technical School of Architecture] of the Universidad Politécnica de Madrid. He was awarded Fulbright/MEC and Bankia scholarships at the Academy of Spain in Rome, and worked as a researcher at the Columbia University in New York for years. He was visiting professor and supervisor at several Schools of Architecture and Academic Institutes in Europe, Asia, North and South America. He authored several books and publications, and his work has been awarded national and international prizes including the Saloni Award and the Special Mention of the European Architecture Award Luigi Cosenza (2000), the Prize of the Venice Architecture Biennale (in 2000, 2005 and 2016), the prize of the Architecture Biennial Miami (2003), the Royal Institute of British Architects ar+d award (2004) and nominations for the Klippan Award and for the Lifetime Achievement Swiss Architectural Award. His two-fold work as a professional and researcher was featured in a number of publications both in Spain and abroad.

**Manuel Blanco Lage** (1955) graduated in Architecture and is Dean of the *Escuela Técnica Superior de Arquitectura* (ETSAM) [Higher Technical School of Architecture] of the Universidad Politécnica de Madrid, where he is full professor of Architectural Composition and professor of *Análisis de la Arquitectura* [Architecture Analysis] and *Análisis de la Imagen de la Ciudad* [Analysis of the Image of the City]. He is PhD in Architectural Composition (1987 – ETSAM). From 2013 to 2017, he was Director of the CSDMM-UPM (*Centro Superior de Diseño de Moda de Madrid* [Madrid Superior Center of Fashion Design]) and is currently its CEO, and is the Director of the Research Group and the PhD Programme in *Arquitectura, Diseño, Moda & Sociedad* [Architecture, Design, Fashion and Society]. He was the Curator of the Spanish Pavilion at the X Venice Architecture Biennale, and became the Director of the Museo Nacional de Arquitectura y Urbanismo de España in 2007. He designed several exhibitions and currently oversees the museographic project of the Museo de las Colecciones Reales of Madrid. He is the Commissioner of the DIMAD (Association of Designers of Madrid), a Member of the ICAM (International Confederation of Architectural Museums), the Director of the First International Congress on Architectural Archives, a founding member of the SAR (Section of Architectural Archives) of the ICA (International Council on Archives) and was a member of its Executive Committee (2004-2008). He authored several publications and contributed to a number of media for the architectural and cultural section.

**Francesca Bonfante** (1957), architect, is Full Professor in Architecture and Urban Composition at the Politecnico di Milano, where she teaches and carries out research work about the relationship among architectural design, city and landscape. Her interests focus on the following study realms: architecture for the exchange and industrial city, architecture and shaping of public buildings, architecture, sport, leisure, and the city. She authored several publications, and contributed to international researches and meetings. From 2016 to 2019, she was a member of the Council of the *Scuola di Architettura Urbanistica Ingegneria delle Costruzioni* (AUIC) [School of Architecture Urban Planning Construction Engineering]. From 2012 to 2019, she was coordinator of the Council of the Master's Degree in *Architecture-Architectural Design*, later (since 2017), Master's Degree in *Architecture and Urban Design* [Architettura e Disegno Urbano]. Since 2019, she has been a member of the Board of the multi-disciplinary PhD Programme of the Department of *Architettura, Ingegneria delle Costruzioni e Ambiente Costruito* [Architecture, Construction Engineering and Built Environment].

**Federico Bucci** (1959) is Full Professor of History of Architecture at the Politecnico di Milano where he also acts as Rector's Delegate for Cultural Policies, Vice-Rector of the Mantua Campus and responsible for the UNESCO Chair. He was a visiting professor at the Texas A&M University, at the Institute of Architecture of Moscow, at the Universidad de Los Andes in Merida, Venezuela, at the Pontificia Universidad Catolica de Chile, at the University of Southern California in Los Angeles and at the ETSAB of Barcelona. He worked at the archive of Albert Kahn Inc. in Detroit and at the CCA of Montréal. He was a member of the American Society of Architectural Historians and participated at a number of national and international meetings. He curated several exhibitions about Italian architecture and authored a number of publications. He collaborated with the magazines "Domus", "Quaderni di architettura", "Rassegna", "L'architettura. Cronache e storia" and is currently a member of the editorial staff of "Casabella".

**Andrea Campioli** (1962), architect, Full Professor of Technology of Architecture at the Politecnico di Milano.

He teaches and carries out research work about the effects of technological and technical innovation of design culture in architecture and industrial design, with a focus on the processes aimed at environmental sustainability in the lifecycle of buildings. He authored several essays and articles about

these issues for national and international magazines. He chaired the Degree Programme in *Scienze dell'architettura* [Sciences of Architecture] of the *Scuola di Architettura e Società* [School of Architecture and Society] and was a member of the Assessment Committee of the Politecnico di Milano. Currently he supervises the Degree Programme in *Progettazione dell'architettura* [Architectural Design] of the *Scuola di Architettura Urbanistica Ingegneria delle Costruzioni* [School of Architecture Urban Planning Construction Engineering] of the same university.

**Alberto Campo Baeza** (1946), architect, is Emeritus Professor at the *Escuela Técnica Superior de Arquitectura* (ETSAM) [Higher Technical School of Architecture] of the Universidad Politécnica de Madrid. He taught at several international-level Schools of Architecture including ETH in Zurich, EPFL in Lausanne and the University of Pennsylvania in Philadelphia. He combines professional and academic activity. In 2019 he has been elected Honorary Fellow by the American Institute of Architects and has been awarded the Gold Medal of Architecture by the Higher Council of Colleges of Architects of Spain. Also in 2019 has been named honorary doctorate by the Pablo CEU University in Madrid, and also by the University Lusiana of Lisbon in 2020. His designs for cultural, institutional and housing buildings received a number of international-level awards. Among the most recent: the Bigmat Grand Prize in Berlin in 2015, the Architizer A + Awards Prize, in 2017; and the Piranesi Prize in 2018.

**Jesús Donaire García de Mora** (1974) graduated in Architecture from ETSAM, the School of Architecture of the Universidad Politécnica de Madrid. He obtained a Master of Science Degree at the Columbia University, New York, with an Honour Award for Excellence in design. He developed his research activity thanks to Fulbright and William Kinne (Columbia) scholarships, as well as to scholarships from the Consejo Social of UPM and the Academy of Spain in Rome.

Since 2009, he has been Full Professor of Architectural Design at ETSAM and since 2016, visiting professor at the Politecnico di Milano. He was Associate Professor at the University Nebrija, a visiting professor at Suffolk University (Boston) and at the Barnard and Columbia College of Architecture, New York. He was invited as speaker, tutor of seminars and jury member at various universities and cultural institutions in Europe, the US and Canada. He authored several publications, was the editor of the architectural culture blog “BMIAA” and the secretary of the Big-Mat International Architecture Award. He worked with David Chipperfield in London and with Jesús Aparicio and Alberto Campo Baeza in Madrid. He currently heads his own architecture practice and develops internationally recognised designs.

**Emilio Faroldi** (1961), architect and PhD, is Full Professor at the Politecnico di Milano, where his research activity addresses architectural design-related issues with a special focus on the relationships among concept, design and construction of the architectural phenomenon.

He organised meetings, training courses and international design seminars.

For over a decade, he chaired and coordinated the Degree Programmes in *Architectural Sciences* and *Architectural Design* at the *Scuola di Architettura Urbanistica Ingegneria delle Costruzioni* [School of Architecture Urban Planning Construction Engineering] of the Politecnico di Milano, where he teaches. He authored several publications and is currently Editor in Chief of the “TECHNE Journal of Technology for Architecture and Environment” and Director of the 1<sup>st</sup> and 2<sup>nd</sup> level Master’s Degree in *Sport Architecture* (MSA), formerly *Progettazione Gestione delle Infrastrutture Sportive* [Design Construction Management of the Sport Infrastructures]. He teaches at the *International Academy of Architecture*, and since January 2017, has been Vice-Rector of the Politecnico di Milano.

**Gennaro Postiglione** (1961) is Full Professor of Interior Architecture at the Politecnico di Milano where he is Supervisor of the Master’s Degree in *Architettura – Ambiente Costruito – Interni* [Architecture – Built Environment – Interiors]. His researches focus on domestic interiors, museography and the preservation and dissemination of collective memory. In addition, his research activity targets the reuse and adaptive enhancement of minor heritage and the exploration of the new building typologies better equipped to meet the new housing requirements emerged over the last decade in a way that puts architectural resources

at the service of public interest. He is a member of the editorial board of the magazine “AREA” and of the editorial committee of the “Journal Interiors”. His recent publications include *Exhibiting architecture* in “Domés”, nr. 2/2018; L'intervento sull'esistente come “ri-scrittura” dello spazio, in: F. Lanz (ed.), *Patrimoni Inattesi*, Siracusa 2018; *The Atlantic Wall Linear Museum*, in “Turris Babel”, nr. 108/2017.

**Alessandro Rocca** (1959), architect, graduated from La Sapienza University in Rome, and is a PhD in “Methodological Questions in Architectural Design” at the University of Genoa. He is Full Professor of Architectural and Urban Design at the Department of *Architettura e Studi Urbani* (DAStU) [Architecture and Urban Studies] of the Politecnico di Milano, head of the AUID (*Architectural Urban Interior Design*) PhD Programme, a member of the Board of the Politecnico di Milano School of Doctoral Programmes, a member of the scientific committee of the CA2RE European doctoral network, vice-coordinator of the Master's Degree in *Architettura – Ambiente Costruito – Interni* [Architecture – Built Environment – Interiors]. As a professor, he is involved in the Design Workshops of the Architecture Master's Degree and AUID Doctoral Programme, within which he pursues a higher integration between research activity and theoretical and practical meditation about architectural design.

**Ilaria Valente** (1958) is Full Professor in Architectural and Urban Design at the Department of *Architettura e Studi Urbani* [Architecture and Urban Studies] of the Politecnico di Milano, where she has worked as a professor and researcher since 1984. She is PhD in Architectural Composition (1992–I.U.A.V.). Since 2013, she has been Dean of the *Scuola di Architettura e Società* [School of Architecture and Society], and since 2016, she has been Dean of the *Scuola di Architettura Urbanistica Ingegneria delle Costruzioni*; since 2017 she has been vice-president of the EAAE (European Association for Architectural Education). In 2020, she became President of the Italian University Conference of Architecture.

**Emilio Tuñón Álvarez** (1958) is full professor at ETSAM in Madrid. He taught at the Princeton School of Architecture (2008-2010), at the Harvard Graduate School of Design (2006) and at the École Polytechnique Fédérale de Lausanne (2005).

In 1993, he co-founded the research cooperative CIRCO with Luis Moreno and Luis Rojo, and obtained the FAD Award (2007) and 3<sup>rd</sup> BIAU Award (2002).

In 1992, he established Mansilla + Tuñón Arquitectos with Luis M. Mansilla. Their main works include the Museo de las Colecciones Reales (Madrid, 2016), the Relais & Château Atrio (Cáceres, 2012), the MUSAC (León, 2007), the documentary centre “El Águila” (Madrid, 2003), the auditorium Ciudad de León (León, 2003), the Museo de Bellas Artes de Castellón (Castellón de la Plana, 2000) and the Museo de Zamora (Zamora, 1996).

His work has obtained several acknowledgments including the RIBA International Fellow (2019), Premio Eduardo Torroja (2018), Premio Arquitectura Española (2017), Premio Arquitectura Española Internacional (2017), Premio FAD (2017), Premio COAM (2016), Medalla de oro al Mérito de las Bellas Artes (2014) and the Mies van der Rohe Award (2007).

**Ignacio Vicens y Hualde** (1945) graduated in architecture from ETSAM where he later obtained a PhD with an “extraordinary award”.

Since 1997, he has been Full Professor of Architectural Design at the *Escuela Técnica Superior de Arquitectura de Madrid* [Higher Technical School of Architecture of Madrid]. At the same School, he chairs the Cátedra Blanca CEMEX and the “CULTURA DEL HABITAT” research group. He was visiting professor and held courses and lectures at some of the most prestigious international universities. His work has been featured in several architectural magazines across the world and received several acknowledgements. Besides his activity in the teaching and professional realms, he has tried to maintain an active presence in the cultural world. He is a member of the editorial board of “NUEVA REVISTA” and was a member of the editorial board of the magazine “ARQUITECTURA”. He was a member of the management committee of several foundations including Fundación Real Toledo, Fundación Camilo José Cela, Fundación Félix Granda and Fundación MARCC.



He received the gold medals of the Universidad Politécnica de Madrid and of the *Escuela Técnica Superior de Arquitectura de Madrid*. Recently he became an international member of RIBA (Royal Institute of British Architects).

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He was visiting professor at the Harvard Graduate School of Design and contributed to a number of Architectural and Urban Design seminars at several international universities.

He authored several books and was curator of the Italian Pavilion at the Venice Biennale in 2014. He also contributed to the organisation and design of the XV, XVI, XVIII and XIX editions of the Triennale of Milan. He is a member of the scientific committees of the XXI Triennale 2016, of MAXXI in Roma and of the Enciclopedia Treccani.

With his firm CZA, he designed and built several works that obtained awards and mentions, and participated in a number of national and international competitions.



Aldo Rossi, *Interior with print*, 1991.  
Etching with watercolour on paper.  
PdA. © Eredi Aldo Rossi, courtesy Fondazione Aldo Rossi.

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«Being an architect is a vocation, teaching architecture is a vocation to the square as one needs quite an élan vital, otherwise it is pointless to even try. [...] Future architects must be educated in their minds, hearts and senses. The information of the different technical disciplines cannot be analytical but must address the real requirements of a modern architect who is increasingly the creator of new phenomena, and coordinates without replacing the activities of the specialists he works with. Information, all of it, must be used in educational terms» (Rogers, 1959).

Such famous statement, written in the late 1950s by Ernesto Nathan Rogers about the education of architects, brilliantly summarises the set of implications underlying the teaching of architecture. These include the knowledge and transmission of “technical disciplines” as much as the “élan” of an “educational” practice that can never be merely the transmission of notions. The dialogue between two polytechnic institutions, the *Scuola di Architettura Urbanistica Ingegneria delle Costruzioni* (AUIC) [School of Architecture Urban Planning Construction Engineering] of the Politecnico di Milano and the *Escuela Técnica Superior de Arquitectura* (ETSAM) [Higher Technical School of Architecture] of the Universidad Politécnica de Madrid, encourages and stimulates a meditation about the teaching of the architectural discipline that, compared to many others, offers remarkable levels of variability, interpretation and “customisation”, as it incorporates features and foundations of both scientific and artistic disciplines.

Comparing teaching itineraries and methodologies within the same School, and between different Schools, highlights different features, specificities and qualities. As explained in the essays collected in this book, the figure of the “professor” plays a central role in the educational and pedagogic process. His work, in and out of the classroom, represents the “living” testimony to the critical-theoretical debate developed over time. In this sense, this book represents a cultural survey of the thought and work of some of the protagonists of the teaching-learning relationship.

The construction of a scientific and reasoned bibliography on these issues is extremely important, albeit challenging, as it must include different realms and types of contributions. Such bibliographic itinerary is designed as an operational tool that, while non-exhaustive regarding the figures and issues involved in architectural teaching, hopefully activates explorations and surveys about the relationship between practice and theory in such activity within the process of cultural education of architects.

The bibliographic itinerary provides a critical selection of the main reference texts about the teaching and education of architecture and design, with a particular focus on the two cultural contexts of the Schools involved in the dialogue. This reasoned bibliography is designed to trace an “itinerary” aimed at

guiding whoever intends to approach the issues in question.

Given the high complexity and heterogeneity of the contributions, the organisation of the bibliography opted for a chronological listing of references, articulated into two main thematic realms of reference that can be used to explore in a more or less direct way the issues treated in *Teaching Architecture*.

The first section, titled “education and transmission of knowledge in the education of architects” lists the main books – mostly Italian – about the teaching and education of architecture. They range from contributions about some masters and professors of Italian Schools of Architecture – about whom several bibliographic references are available and summarised here – to some meditations about teaching in specific contexts (Milan, Venice, Rome), as well as reference texts about education and teaching by the authors of the essays in this book, and therefore related to the Italian and Spanish contexts.

In addition, the bibliography includes a selection of texts about the “transmission of knowledge” not related to this specific disciplinary realm. The second section, titled “for a culture of design”, presents a selection of fundamental texts in terms of the cultural orientations of the architect, and for this reason considered essential for his education. This section also includes some papers by the professors involved in this book, considered as particularly relevant for their critical thought.

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Alberto Campo Baeza  
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Milan, November 22,  
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Maria Pilar Vettori  
and Eduardo Souto de  
Moura, Politecnico di  
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Alberto Campo Baeza  
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Jesús María Aparicio  
Guisado, Emilio  
Faroldi, Alberto  
Campo Baeza,  
Politecnico di Milano,  
November 23, 2018.  
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Emilio Faroldi,  
Manuela Blanco  
Lage, Ilaria Valente,  
Politecnico di Milano,  
November 23, 2018.



Emilio Tuñón Álvarez,  
Federico Bucci,  
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November 23, 2018.



Emilio Faroldi, Madrid,  
February 21, 2020.  
Photo by Norman  
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Maria Pilar Vettori,  
Milan, November 21,  
2018. Photo by  
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«...No nourishment is more invigorating  
than that coming from young people»

(Ernesto Nathan Rogers, 4 April 1963)

We dedicate this work to all those  
who love Architecture,  
still and always teach and learn it  
with the curiosity of the a student  
on the first day of school.

Emilio Faroldi  
Maria Pilar Vettori