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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 *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 1st and 2nd level Master’s Degree in *Sport Architecture* (MSA), formerly *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.

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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.

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TEACHING ARCHITECTURE
TWO SCHOOLS IN DIALOGUE

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EMILIO TUÑÓN ÁLVAREZ
IGNACIO VICENS Y HUALDE

••••• LetteraVentidue



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

Seneca

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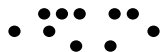
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APPARATUS

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.

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. 509¹. 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»². 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.

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»³. 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)»⁴. 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.

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 character⁵.

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”⁶, in a way that places an idea of future at the centre of the theoretical meditation and pragmatic

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*⁷ reflects a situation where 74% of

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 intuition⁸.

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 change 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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APPARATUS

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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.

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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 1st and 2nd level Master’s Degree in *Sport Architecture* (MSA), formerly *Progettazione Costruzione 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 “Turrís 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 3rd 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).

Maria Pilar Vettori (1968), architect and PhD, is Associate Professor at the Politecnico di Milano. She teaches at the *Scuola di Architettura Urbanistica Ingegneria delle Costruzioni* [School of Architecture Urban Planning Construction Engineering] of the Politecnico di Milano in the area of Technological Design of Architecture. She contributed to research and consulting projects concerning processes, methods and tools for programming, construction and management of architecture, with a particular focus on innovation in design and production processes for the structures and infrastructures for healthcare, wellness and sports, research and production. She has participated in and organised conferences, seminars and workshops, and has worked consistently on studies and publications.

Cino Zucchi (1955) obtained a BSAD at the MIT and graduated in Architecture from the Politecnico di Milano where he is currently Full Professor of Architectural and Urban Design.

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.

«...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